

slacks

THE NATAL AGRICULTURAL JOURNAL

No. 5.

1910.

Vol. XIV.

Of Special Interest :

THE END OF THE OLD REGIME.

TANNING IN S. A.

TREE-PLANTING IN NATAL.

CAPONISING.

TOP-WORKING FRUIT TREES.

THE ADVANCE OF AGRICULTURE.

SHIELD BUDDING THE MANGO.

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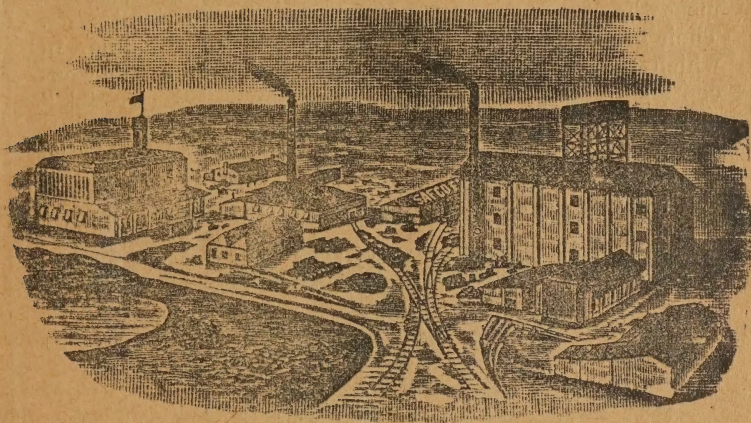
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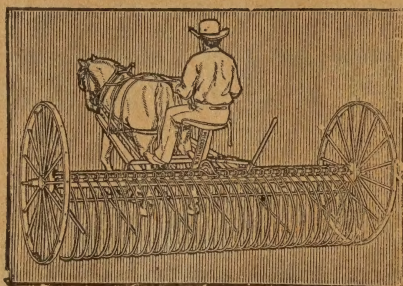
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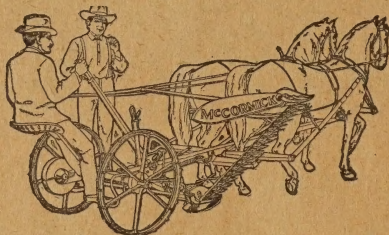
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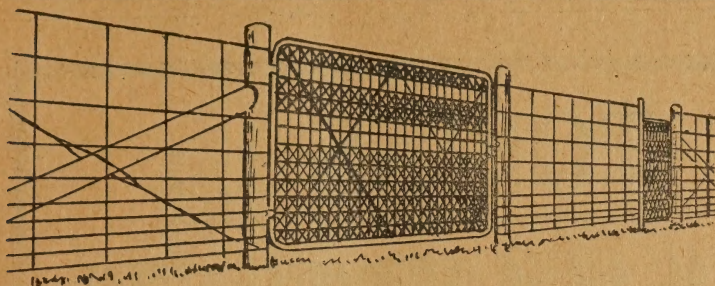
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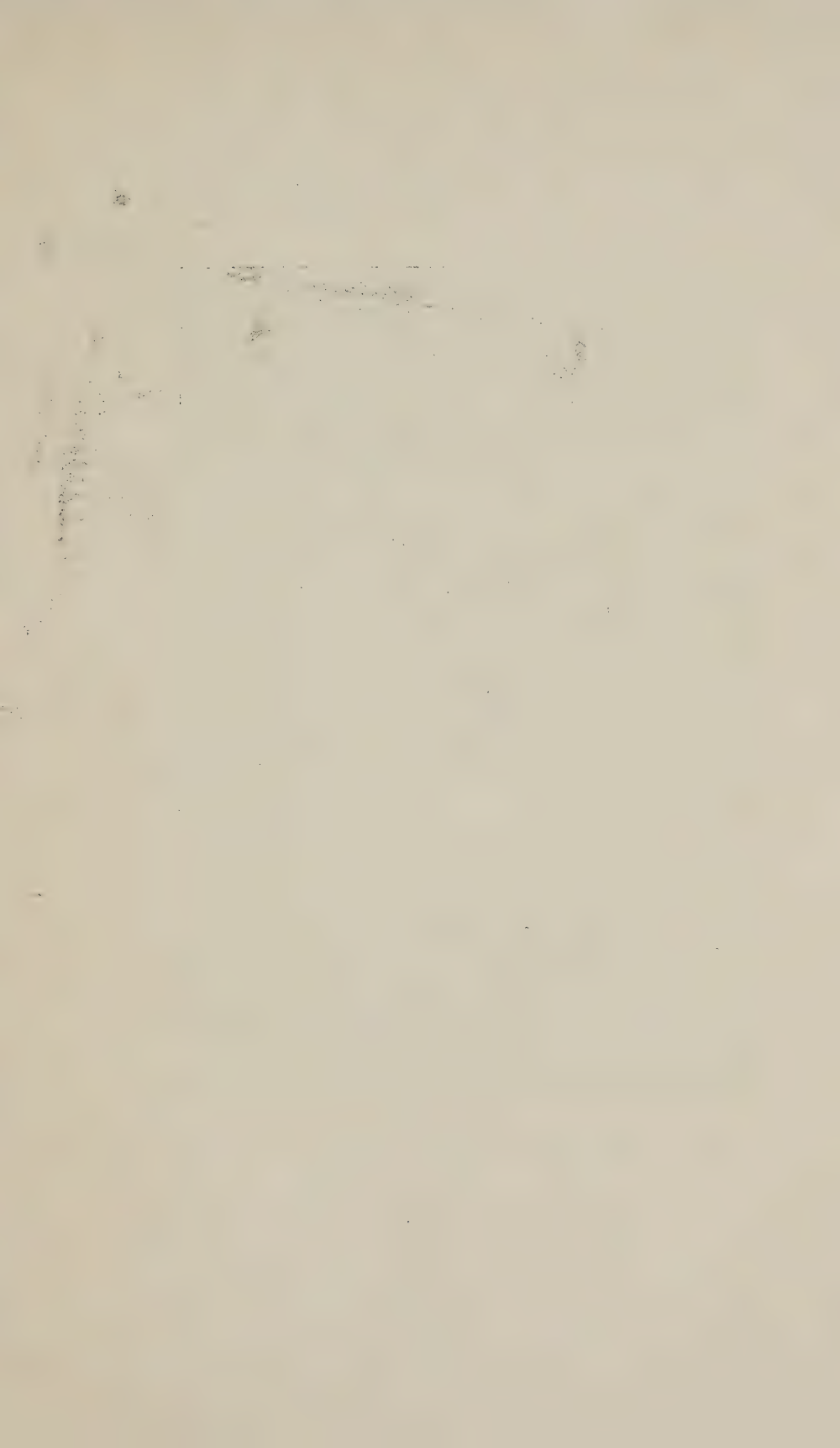
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* * * “*The Markets and Crops*,” issued as a supplement with each number of the JOURNAL, contains full information regarding South African and oversea markets and crop conditions, and Commercial Intelligence Bureau announcements





The Hon. W. A. Deane.

Natal's last Minister of Agriculture before Union.

The Natal Agricultural Journal.

The End of the Old Regime.

THE last of Natal's Ministers of Agriculture under Responsible Government has gone. At the moment of writing, the Hon. W. A. Deane is on a visit to England and Colonel E. M. Greene, Minister of Railways and Harbours, is acting in his stead as Minister of Agriculture; but by the time these lines fall under our readers' eyes the Portfolio of Agriculture, as the Portfolios of other branches of the Administration, will automatically have ceased to exist, and Natal will have become constitutionally a Province of United South Africa.

Facing this page is a portrait of the last of Natal's Ministers of Agriculture, the Hon. W. A. Deane, M.L.A. Mr. Deane was the fifth—or, strictly speaking, if we include Sir Henry Binns, who joined, for the space of a month or so only, the office of Minister of Agriculture with that of Prime Minister, the sixth—Minister holding the Portfolio of Agriculture since the granting of Responsible Government in 1893. His predecessors, named in the order in which they held office, were: Mr. Edward Ryley, 1897-98 (Member for Klip River); Mr. F. A. R. Johnstone, 1898-99 (Member for Newcastle); the Hon. H. D. Winter, 1899-1903 (Member for Weenen); and the Hon. W. F. Clayton, 1903-1906 (Member for Victoria County). Portraits of these gentlemen will be found elsewhere in this issue. The present, we think, will be a fitting occasion, as the last issue of the *Journal* under the old Constitution, to outline, however briefly, the terms of office of each of the gentlemen who have served Natal in the capacity of Minister of Agriculture, and to refer to the chief events which took place during the time they held office, as well as to give a few brief particulars of the political life of each of these gentlemen. We begin our survey with the gentleman who first held office exclusively as Minister of Agriculture, namely,—

MR. EDWARD RYLEY.

Mr. Ryley entered the arena of politics of 1890; he was returned in that year as member of the Legislative Council for Ladysmith. He and Mr. John Bainbridge stood on the Responsible Government platform, the defeated candidates being Sir Thos. K. Murray and Mr. W. C. Bester. In 1892 he and Mr. Bainbridge were again returned; Mr. G. F. Tatham

and Mr. Ignas de Waal were the unsuccessful opponents. In the year following there was another election, and Mr. Ryley was again returned, having for colleagues Mr. Bainbridge and Mr. H. Smith.

For some time—until the abolition—Mr. Ryley was a member of the Council of Education. Mr. Ryley was chairman of the 1894-5 Stock Commission, on the recommendation of which the present Veterinary Department was established. To this Commission was also due the Lung-sickness Act of 1897.

In February, 1897, Mr. Ryley, at the invitation of the late Mr. Escombe, joined the Administration as Minister of Agriculture. All the energies of the Department at that time were directed to the keeping of rinderpest out of the Colony. The efforts were unsuccessful. The first case occurred amongst some Kafir cattle near Dundee. The several herds were killed and paid for. The next case occurred at Mr. Field's farm, near Ladysmith, and other cases broke out almost simultaneously in different and widely separated parts of the Colony. It was then decided that the destruction of herds would not be practicable, and, on the advice of Mr. Watkins-Pitchford, inoculation with bile, until serum could be obtained, was introduced. Mr. Ryley immediately took steps to get salted cattle both from the Orange River Colony and the Transvaal. Unfortunately, owing to the season being midwinter, the cattle were in poor condition, and could not be held for a considerable time.

At the election of 1897 Mr. Ryley was rejected by the Ladysmith electorate. He then took a three years' holiday to England.

During his term of office, the whole attention of the Department being centred on rinderpest, Mr. Ryley could devote barely any time to other agricultural needs. The officers of the Department were then engaged from early in the morning till late at night. The expenditure amounted to £176,000; in the Cape Colony the corresponding expenditure was £1,744,000. These figures will roughly indicate the immense pressure of responsible work that must at that time have fallen on the shoulders of one in the position of a Minister of Agriculture.

Mr. Ryley's father was a farmer and miller in England, and he himself, until he came as a young man to Natal, was engaged with his father in farming. In Natal Mr. Ryley's occupation has been that of miller and timber merchant.

MR. F. A. R. JOHNSTONE.

Mr. Ryley was succeeded by Mr. F. A. R. Johnstone, who at the time represented the Newcastle constituency.

A good many years have elapsed since Mr. Johnstone first entered public life. In 1867 he was elected member of the Transvaal Volksraad for the Wakkerstroom District. His colleague was the late Commandant-

General P. J. Joubert. In 1879 he was appointed a Member of the Legislative Council under the Administration of the late Colonel Lanyon. In 1882, on the retrocession of the Transvaal, Mr. Johnstone removed to Natal. In 1890 he re-entered public life as Member of the then Legislative Council for Newcastle. His platform was that of the "Responsible Government" party. For eleven years he was a representative of the Newcastle constituency in Parliament. In 1898 he joined the Binns Ministry as Minister for Agriculture. During his term of office the Veterinary and Mines Departments were made directly responsible to the Minister; a new Mines Law and Regulations was drafted and passed into law, investigation work in diseases of stock, especially horse-sickness, lung-sickness, and rinderpest, was taken in hand, and the epidemic of rinderpest brought to an end. During Mr. Johnstone's term of office the *Agricultural Journal* was started. Mr. Johnstone retired from office in February, 1899.

THE HON. H. D. WINTER.

The third Minister of Agriculture was the Hon. H. D. Winter. Mr. Winter is Colonial born and was educated at the old High School, Maritzburg. After leaving school he was with Messrs. A. Fass & Co. for many years, where he received a commercial training. In 1870 he went to the Diamond Fields for that firm, and returned to Maritzburg in 1871. He then purchased transport plant, and continued transport-riding until 1882. During that period—in 1875—he started stock and agricultural farming in Weenen County, and since then he has taken a keen interest in stock of all kinds, and in agricultural shows. He was for many years a Field Cornet for the county. In 1889 he was appointed Justice of the Peace. On the change of Government in 1893 he was returned to Parliament as a representative for his county. Amongst his first attempts at legislation was an endeavour—unsuccessful—to get the imposing of a tax of 20s. on Natives leaving the country for work. In February, 1899, as Minister of Agriculture, he joined the Binns Ministry, and in June of the same year, on the death of Sir Henry Binns, he joined the Hime Ministry. At intervals, in addition to his own particular duties, he temporarily occupied other Ministerial positions—the Ministry of Native Affairs during the absence of the Hon. F. R. Moor, M.L.A., in Australia, and for several months he acted as Colonial Treasurer.

During Mr. Winter's administration much was done to forward the agricultural interests of the Colony; bacterial research was advanced, inoculation against rinderpest was made compulsory, the Tuberculosis Act was passed, the Glanders Act was amended in the matter of compensation, a Proclamation was issued under the Contagious Diseases Act of control the importations of stock, experimental farms were started,

forestry was taken in hand, refrigeration cars were placed on the railway, irrigation on an extensive scale was begun, and cold storage was established—to mention the leading innovations which took place.

THE HON. W. F. CLAYTON.

In 1903, Mr. Winter was succeeded by the Hon. W. F. Clayton. Mr. Clayton was born and educated in London, coming to Natal in 1876. Almost since his arrival in the Colony he has been associated with politics, and in 1901 he was elected to the Legislative Assembly. Among the more important features of his Ministerial work mention may be made of the following:—Opening out of the Central Experiment Farm from its second year; erection and opening of the Cedara School of Agriculture; starting of stud stock at Cedara; obtaining co-operation of neighbouring Colonies with regard to the destruction of locusts; passing of Plants' Diseases Act, Burrweed Amending Act, East Coast Fever Act, Scab Amendment Act, Agricultural Development Act, etc.; the institution of the Land Board; opening up of Winterton—30 settlers; opening up of land in Zululand—some 170 farms allotted—and arrangements concluded for central sugar mill; arrangements made for curing tobacco at Weenen; prosecution of Natal's part in the South African Products Exhibition in London in 1907; holding of East Coast Fever in check until the rebellion caused quarantine regulations to be broken through.

On retiring with the Smythe Ministry in November, 1906, Mr. Clayton was presented with an address from the Staff of his Department warmly acknowledging the cordial relations which had existed during his tenure of office.

THE LAST MINISTER.

Such are the leading features of the Ministerial work performed by each of the successive holders of the Portfolio of Agriculture up to the time when Mr. Deane took office. Of Mr. Deane's work it is impossible at the present time to form a just estimate; it is all too recent to enable one to gauge its importance and its influence upon the agriculture of the Colony. A bare enumeration of the leading features of his work may, however, be made without any attempt at guaging the effects which such work has had upon the Colony.

To say that farming in Natal has made very substantial progress during Mr. Deane's term of office as Minister of Agriculture is to make no more than a very moderate statement of fact. Taking up the reins of office in November, 1906, Mr. Deane early occupied a place of distinction in the public eye by taking in hand during that season the question of organising an export trade in maize. The indications that season were for a crop considerably above the average, and recollecting how in



Sir H. Binns.



Ed. Ryley, Esq,



F. A. R. Johnstone, Esq.



Hon. W. A. Deane



Hon. H. D. Winter.



Hon. W. F. Clayton.

NATAL'S MINISTERS OF AGRICULTURE

Under Responsible Government.

(See Leading Article in present issue).

former years the price of mealies in this country had been dependent upon the size of the crop and how an extra large crop meant proportionately smaller returns for the farmer and not, as is the case in an economically sound country, larger returns, Mr. Deane set himself to ensure that farmers should secure returns proportionate to the size of their crop and to encourage mealie growing in this country by organising an oversea export trade in this staple. He approached the shipping companies, and was able to make them see the desirability of lowering their freight rates in regard to mealies in order to encourage a young industry, and he was also instrumental in securing the establishment of an "export" rate on the Natal Government Railways. A grading officer was appointed to examine and grade at the port all mealies intended for shipment oversea, and gradually the machinery for an export trade was got into working order and then handed over to the Railway Department. The example of Natal has been followed by the other Colonies of South Africa, and a grain trade has been established on a scale the like of which has never before been seen in South Africa, and which gives promise of increasing to an enormous extent in the near future. Last year the exportation of mealies brought into South Africa fresh wealth to the extent of over £650,000. It was at the time of the establishment of the maize export that the Commercial Agency was established in London with Mr. C. W. F. Harrison in charge. Turning from his successful endeavour to organise an export trade in maize, Mr. Deane next devoted his attention to fruit and lamb, whilst he also interested himself during the latter portion of his term of office in an endeavour to create an export trade in Kafir corn. With the results of the attempts which have been made to establish a trade with England with fruit and lamb all regular readers of this *Journal* are acquainted. In both cases Mr. Deane's efforts have shown what Natal is capable of doing and also what is perhaps a little beyond her at the present time, and if they have not resulted in an export trade in these two commodities being placed on as successful a basis as that of maize it has not been the fault of Mr. Deane and his helpers. In East Coast Fever Mr. Deane found an evil which troubled the Colony from the day he took office until the day he left. He has been subjected to a great deal of criticism because he was not able to prevent the disease from spreading, but all such critics overlook the disability under which he had to fight the disease in that he was unable, by reason of the straitened nature of the Colony's finances, to obtain sufficient money to enable him to undertake a campaign against the disease sufficiently comprehensive to ensure success. Under this disability Mr. Deane did his best, and he went further than simply to endeavour to stay the course of the disease, by giving assistance to farmers who were suffering

through the ravages of the disease among their herds. This assistance took the form of the sale, upon easy terms, of mules, donkeys and sheep to farmers, the rendering of financial assistance for the purpose of fencing farms and the erection of dipping tanks, of the purchase of cattle from infected herds at a reasonable figure in order to insure farmers against heavy loss, and by the purchase of steam ploughs for the purpose of helping farmers who had lost their cattle to plough their lands. These are the chief directions in which Mr. Deane endeavoured to assist farmers who were in danger of loss through the ravages of East Coast Fever, and it is probably due to Mr. Deane's efforts in this direction that the effects of East Coast Fever upon farming in the Colony have been relatively unnoticeable. Another great direction in which Mr. Deane has done his utmost to secure for Natal a larger white population, and many fresh areas of good farm land have been opened up both in Natal and in Zululand. As some indication of what Mr. Deane's efforts have resulted in, it may be mentioned that 530 fresh settlers have been put on the land during his term of office.

Such are the chief directions in which Mr. Deane's energy as Minister of Agriculture has been turned; and, before concluding, mention may be made of the beginning which has been made during his term of office in the introduction of primary agricultural education into Government schools. Also it should be mentioned that research work in connection particularly with blue-tongue, horsesickness and East Coast Fever has continued, with every encouragement from Mr. Deane, and that the School of Agriculture at Cedara has grown very considerably during his term of office.

Natal is now entering upon a new era—an era, all are convinced, of progress and prosperity. General Botha has been selected as the first Union Prime Minister, so that, with such a leader—a leader who has already achieved distinction by the sympathetic and progressive manner in which he has directed the agricultural affairs of the Colony of which he has been Prime Minister and Minister of Agriculture—Natal and the Union as a whole should make very rapid and substantial progress under the new scheme of things which comes into force with the beginning of June.

An abstract of a paper in the *Experiment Station Record*, Vol. XXI., No. 2, of the United States Department of Agriculture, shows that naphthalene may be used with success for the purpose of protecting grafts and cuttings from the attacks of the larvæ of insects. It is also stated that vaporite has given good results when employed for that purpose.

The Maize Crop in April.

PROBABLE CROPS—645,000 MUIDS.

THE decline in the condition of the maize crop which we noted last month continued during April, and on the 30th April, according to the reports we have received, the general condition for the whole Colony was 2·27, as compared with 2·38 on March 31st. The March condition was representative of a crop averaging 4·1 muids; the yield according to the condition reflected by the figures for 30th April is now likely to be not more than 4 muids—3·91, to be more exact.

The following figures show that the crop this year is behind that of last year, so far as condition is concerned: the statement gives the average condition and the corresponding yield per acre in muids at the end of each month up to date, for this season and for last year; and we also continue last year's figures up to the end of the season, in order that readers may see what condition our crop has to arrive at before the possibility of last year's yield per acre is arrived at:—

At End of —			Condition	Yield	Condition	Yield
January	...	...	2'0	3'44	3'1	5'34
February	...	...	2'52	4'54	3'0	5'16
March	...	...	2'38	4'1	2'69	4'63
April	...	...	...	...	2'7	4'65
May	...	...	...	...	2'64	4'54
June	...	...	...	...	2'82	4'86

Appended will be found a table showing the progress or otherwise that the mealie crop is making in the various Magisterial Divisions of the Colony. In studying these figures it should be remembered that the four "conditions," "poor," "fair," "average," and "above the average," are represented by the figures 1, 2, 3 and 4, respectively, and that intermediate figures represent intermediate conditions.

THIS SEASON'S ACREAGE.

We are now in a position to give our readers some idea as to the acreage planted this season. We cannot give exact figures, but have made an estimate on reports from 75 per cent. of the farmers of the Colony, which we think will turn out to be approximately correct. Last season's acreage would appear to have been actually about 164,500 acres; this season we estimate that practically the same area has been planted—namely, about 165,000 acres.

Normally, of course, this season's acreage would have shown a considerable increase over that of last year, in view of the tendency there is to go in more and more for maize cultivation; but as we remarked in a previous article the unfavourable weather conditions in the spring, together with the difficulty of getting sufficient animals for ploughing as a consequence of East Coast Fever, restricted the area put under this crop. Indeed, we are surprised to see that the area is even as large as that of last season.

But whilst the acreage is practically the same as that of last year, the condition of the crop is not as good—the promised yield at the end of last month being about three-quarters of a muid per acre less than at the same time last season. We estimate the crop for this season, according to *present* conditions, at

645,000 MUIDS,

as compared with a promised crop of 770,000 muids at the same time last year. The actual crop last year was 800,000 muids. We hardly think there is much chance of improvement in the prospects of this year's crop: in fact, so late did planting necessarily take place in some of the districts that there is a likelihood that an appreciable percentage of the crop will be carried off by frost before reaping time is over.

CONDITION OF CROP.

(Note.—A condition “above the average” is represented by the figure 4; “average” by the figure 3; “fair” by the figure 2; and “poor” by the figure 1: intermediate figures represent corresponding conditions.)

Division	Condition of Crop at end of—				
	January	February	March	April	
				This Year	Last Year
Lower Umzimkulu ...	3'2	3'0	3'0	1'50	2'5
Alexandra ...	2'5	2'7	2'4	2'60	3'0
Umlazi ...	3'0	2'0	2'0	2'0	2'0
Inanda and Indwedwe ...	3'2	3'0	3'4	3'0	3'0
Lower Tugela and Mapumulo	2'4	2'5	2'5	2'50	3'0
Impendhle ...	1'0	1'2	2'0	1'50	3'0
Alfred ...	2'5	3'0	2'5	1'67	3'0
Ixopo ...	2'7	2'7	2'8	2'5	2'75
Richmond ...	2'2	2'4	2'4	2'28	2'0
Umgeni ...	2'4	2'4	2'1	2'14	3'4
New Hunover ...	2'4	2'4	2'4	2'59	3'0
Lion's River ...	1'8	1'8	2'3	1'82	3'0
Umvoti ...	2'2	2'5	2'5	2'29	3'4
Krantzkop ...	2'8	2'8	3'0	2'75	3'0
Underberg ...	1'0	1'0	3'0	1'0	3'0
Polela ...	1'0	2'0	1'5	2'0	4'0
Bergville ...	1'8	2'6	2'8	2'75	2'4
Estcourt ...	1'9	2'3	2'2	2'15	2'7
Weenen ...	1'6	2'0	1'7	1'67	2'0
Klip River ...	2'0	2'2	2'1	1'79	2'0
Umsinga ...	2'6	2'0	2'3	2'0	2'0
Dundee ...	2'2	2'5	2'8	2'23	2'0
Newcastle ...	2'2	2'4	2'4	2'0	2'3
Vryheid and Ngotshe	2'6	3'2	2'3	3'0	1'0
Utrecht ...	2'5	2'3	2'0	2'0	3'0
Paulpietersburg ...	4'0	3'4	2'5	4'25	...
Babanango ...	3'0	3'0	2'0	1'0	1'0
Eshowe and Intunzini	2'5	3'0	2'0	2'0	2'0
Entonjaneni ...	3'0	2'8	2'6	2'67	3'0



The "Laboratory" Dip.

THE following letter has been received by the Government Bacteriologist, Mr. H. Watkins-Pitchford, from Mr. Thomas Morton, of "Ashley," Howick Rail, and has been handed to us for publication, as it is thought that Mr. Morton's experiences with the "Laboratory" Dip will be read with interest by cattle-owners in all parts of the Colony. Mr. Morton has made reference in his letter to certain firms—local merchants and dip manufacturers—whose names we omit in justice to the firms concerned. Mr. Morton writes:—"You may remember my calling at your office in December last with a bottle of liquid and telling you that I had started to dip, using your 'Laboratory' Dip, and that I found it was not satisfactory as the ticks were worse since I started using the dip. You told me to get arsenite of soda from — as you had had several complaints against the arsenite of soda supplied by —. I acted upon your advice at once by emptying the tank and re-filling with the arsenite of soda from —, but unfortunately I had only dipped once when the tank burst and I had to have the tank destroyed and re-built, which took some time. During the re-building I continued spraying with your 'Laboratory' Dip as I had to be most careful, having the tick 'fever' on two sides of my farm, as well as amongst the cattle belonging to Natives who live on a part of my farm, these Natives going home from work every night.

"Well, I have been dipping in the new tank since the middle of February," continues Mr. Morton. "I use your 'Laboratory' Dip and put the cattle through the tank every fourth day; when Sunday falls on the fourth day I dip on the Monday. I use thick brick oil, 20 parts, with 1 part of Stockholm tar and 1 part of paraffin, mixed, and paint with the hand inside and outside the ears, the hair between the horns, under the tail, and where the brush of the tail used to be; and I am delighted to be able to tell you that when the cattle are being put through the dip I examine a great number most carefully and cannot find a single tick

anywhere except now and again one or two under the tail, but on no other part of the body.

"I think it is my duty," Mr. Morton concludes, "to write and thank you for the excellent and cheap dip you have given to the Natal farmers. Although I have often heard that one cannot use your 'Laboratory' Dip oftener than once every five or six days, I dip every fourth day and put my oxen into the plough same day after dinner, with no bad results either to milking cows or to oxen. I do all the mixing of ingredients myself. I ought to tell you that for ten months previously I had been spraying with ——'s and ——'s dips and they are not to be compared with your dip. My neighbour, ——, is losing very heavily just now.— Again thanking you for the excellent dip, I remain, etc.—THOMAS MORTON."

South African Pines in London.

In a memorandum dated 21st April the Natal Commercial Agent in London, referring to South African fruit in London, states that there was a small number of cases of Cape pines on the market, which, re-packed, realised 6s. to 7s. a case of one dozen. The size, he adds, is still small. Mr. Harrison regrets that Natal senders have not made experiments this season, as there was a prospect of good sales being effected. The Paris market is also enquiring for South African pines of good quality. He says that the best time during which to ship pineapples (of first-class quality in all respects) is between November and May. "Good prices can be relied upon, but as I have repeatedly urged, Natal should endeavour to set a standard for quality and size."

Mango Culture.

Mr. H. H. Cousins, Director of Agriculture for Jamaica, gives the following useful hints on the culture of the mango:—The mango, when grown naturally from seed, sends down a deep tap root, and it is characteristic of young seedling mangoes that they root very deeply in the earliest stage of their growth. Experiments have shown that a good seed from a strong-growing variety (planted at stake) will give far quicker results in establishing a tree than a seedling set out from a pot. Indeed, in a dry district, the establishment of a mango transferred from a pot to the soil is always a matter of considerable uncertainty. It is desirable, therefore, when setting out an orchard, to plant seeds of the yam or other strong variety of mango. When these are one and a half to two years old they should be stout trees of just the right size for budding. A distance of 30 to 40 feet should be allowed between the trees when developed.

For quick returns from budded trees it is recommended to plant 15 feet by 15 feet or 20 feet by 20 feet, and to cut out every alternative tree when the growth requires it. With the mango, the young buds are not of use for budding. The buds, from wood one and a half to two years old, showing leaf scars on the bare bark, should be selected. It is useless to attempt budding unless the bark lifts freely. When the trees are flushing, the bark can be lifted easily, and there is no difficulty in removing the buds with the slips of excised bark. Buds can be inserted either by cutting out a corresponding piece of the branch to be treated, or the bud can be slipped under a T-shaped incision in the ordinary way. Raffia fibre is a good medium for tying the buds.

In budding old trees, do not cut down the whole tree at once. The main branches should be cut off about a foot from the stem, care being taken not to split the arm, smoothing the edge of the bark and protecting the cut surface with tar. When the new growth is one to one and a half inches in diameter it is fit to take a bud. When the buds have started to grow the rest of the branches can be cut down and similarly treated. It is important to observe that an old tree cut off short below the main branches will probably die, and that care is required in lopping old trees not to remove the whole of the foliage at one operation. When the new shoots have grown, the old stumps of the original branches should be carefully cut close back with a slope toward the trunk of the tree. It is very important in pruning a mango tree to cut close to the main branch or stem so that the wound can heal rapidly. The bark should be bevelled with a sharp knife and the cut end treated with tar. Careless lopping of old trees will result in attacks of insects and fungi upon the exposed tissue, and the death of the trees will be greatly hastened.

The Cyclone Tractor.

Readers of the *Journal* may be interested to know that Mr. Dudley de Ros, of this Colony, has been in England for some months arranging for the formation of a company to be called the African Union Transport Company, Limited, for the purpose of placing Cyclone Tractors on the road in South Africa to deal with the accumulation of traffic at the rail-heads and also for the purpose of taking contracts for ploughing and hauling for farmers. The following is a description of the Tractor:—The 25-H.P. "Cyclone" agricultural tractor (1910 model) has driving wheels 5 feet in diameter by 9 inches broad, and the leading wheels 3 feet 6 inches in diameter by 6 inches broad. The wheels are of best toughened annealed steel, bushed with soft cast iron of special quality.

The threads of the wheels are fitted with trod plates and with special spuds, which overhang the side of the wheels by 6 inches, and practically make the surface of the wheels 15 inches when the tractor is going over soft ground. The gear box is suited to the requirements of ordinary farm hands and men who have never driven a high-speed oil engine before. There are two speeds forward and two speeds reverse, three and six miles an hour. The two sets of gear wheels are always in mesh and are brought into operation by means of a patent double clutch, and we are informed that it is impossible for the merest beginner to damage the teeth of the gear wheels by banging the different speeds into mesh. The reverse is obtained by two bevel wheels which are always in mesh with the bevel pinion.

The engine has two cylinders with a bore of $5\frac{1}{2}$ inches and $6\frac{1}{4}$ inch stroke, the normal number of revolutions being 1,000 a minute. The crank chamber is of cast iron and is fitted with inspection doors on each side. Three large gun-metal bearings lined with anti-friction metal support the crank shaft, which is turned out of chrome vanadium steel and made hollow for purposes of lubrication. In order to enable the engine to be started up easily, a half-compression gear is fitted which acts on the exhaust cam-shaft. A low tension Bosch magneto is fitted in an accessible position on the front supporting arm of the engine on the inlet side. A forced feed system of lubrication is installed on the engine. Both of the cylinders and valves are well surrounded by water jackets, which extend down below the lowest point reached by the pistons. The engine is fitted with a carburettor for the consumption of common paraffin, but if required this can be altered to consume either alcohol or petrol. The engine and gear-box are enclosed in dust-proof cases. It has been thought advisable to fit a drum for pulling the engine out of boggy places or river beds when it gets stuck in crossing streams. The tractor will, it is stated, cross rivers with a good hard bed when the water is not more than 3 feet in the deepest place. The whole tractor has been produced with a view to absolute simplicity of manufacture and working, and anyone can learn to drive after a day's practice. The London price of a 25—30 h.p. tractor is £425.

The Value of Wool-Sorting.

Dr. Pringle, of the Natal Government Asylum, has sent us some interesting particulars of the efforts which Messrs. Pringle Bros., of Bedford, Cape Colony, are making to improve the status of the sheep and wool industry of South Africa. Messrs. Pringle Bros. confine themselves to the pure Rambouillet sheep, and do not cross. They have been steadily working up a type of Rambouillet and have now probably the purest

general flock of Rambouillets in South Africa. They import rams and ewes from the Imperial flock near Paris; and they sell stud and flock rams all over South Africa. Messrs. Pringle Bros.' efforts, however, are not being confined to sheep-breeding. They are also endeavouring to show the advantages to be derived from a careful sorting of wool clips prior to shipment. We published an article on this same subject some months ago in the *Journal*, in which, readers may remember, we pointed out that, whilst South Africa can produce as good wool as most other countries, we are not realising as good prices as we should for our wool because of our neglect of the vital matter of sorting and classing. As an example, bearing out the truth of this, it may be remarked that recently Messrs. Pringle Bros. sent a consignment of 52 bales of wool to London which realised from 6½d. for locks and pieces to 11½d. for special longwool; and their agents in London, in the course of a letter, wrote:—"We trust these prices will be to your entire satisfaction, and would point out that the five bales special sold at 11½d., after deducting all expenses, means that you have secured a trifle over 10d. per lb. clean, which constitutes a record price for any wool sold in this or adjoining districts this season. Our London friends write that they deem it wise to advise that during the inspection of wools up for sale in London on the 26th ulto., it was obvious that Pringle Bros., Glenthorn, clip was of superior nature to that of the other clips on show. It was the remark of several buyers that they wished all South African wools would be classed in this way, and the satisfactory prices obtained for the clip should be an object lesson to our farmers." This is sufficient to show the advantage of care in sorting and classing, in addition, of course, to breeding with a view to improving the quality of the wool. Practical examples like this tell, and we hope that Messrs. Pringle Bros.' success will serve to stimulate farmers in this colony to follow their example.

Queensland Sugar and White Labour.

In connection with our remarks last month on the labour situation in Queensland with reference to the sugar industry, the following extracts from a communication on the same subject sent to his paper by the Brisbane correspondent of the *Louisiana Planter* will be read with interest: "Official figures which have just been issued show that the yield of sugar in Queensland, which practically means the Australian sugar industry, amounted to 133,578 tons during the season just closed, as compared with 151,098 tons in the previous season. This quantity was obtained from 82,692 acres, as compared with 92,219 acres in the previous season. The exact quantity of cane cut was 1,163,000 tons, as compared with 1,433,300 tons. The decrease in the output has about reached bedrock, as all the indications point to a larger area under cane in the coming

season and several seasons following. The yield has been steadily falling, as a result of the disturbances caused by the change from black to white labour—a change that had to be made somewhat rapidly, although although not so rapidly as some of the rabid members of the Labour Party would have desired, the difficulties of the internal management of the industry being nothing to them. Australia, however, has now practically settled down to the new conditions, and any development that takes place will be merely through the aid of white labour, the number remaining of coloured labourers being comparatively small. It is significant, however, that while the Pacific Islander was banished from North Queensland where he worked under a tropical sun, in the scheme for developing the Northern Territory, a tract of country to the north of the centre of Australia, and hitherto neglected, the use of ‘some cheaper form of labour’ is glibly talked about.

“The most important event of this month was the meeting of the Australian Sugar Producers’ Association, a body of growers who have come into existence as a result of the system of small farmers following the dismissal of the kanaka labour. The Association has not long been formed, and the meeting this year was remarkable for the prominence given to the Conference, including an official reception of the delegates by the Chamber of Commerce—all tending to show the recognition of the industry’s importance to the community. This is by way of answer to the Labour Party, whose members do not attach much importance to an industry which they consider has to be bolstered up with a bonus in order that it may pay wages to white workers, and for whom a definite scale of wages has to be laid down by Government regulation. . . .

“The supply of labour in Queensland has been fairly good this year, and as time goes on it is not expected that there will be much trouble to get the cane harvested, although the class of labour offering is not always the best, and Australian growers are always haunted by the fear that at a critical period the men in either the fields or the mills will strike, and thus leave them in the lurch. Then again there is the increasing cost of labour. Although the white man will do more work in a day than the kanaka did formerly on wages, the usual plan is to pay by contract, and a statement was recently issued that it cost fully 25 per cent. (including the bonus) of the value to harvest the cane. On top of this are the milling and marketing charges. To the working during the season half a million pounds were distributed as wages to cane cutters. The President of the Association just referred to, recently said: ‘Let me say that when our Association deals with the labour problem it is with white labour, and with white labour alone, that we are concerned. Other

descriptions of labour have become a negligible quantity in sugar production, and we have not the remotest idea or the slightest wish that any change be made in this direction. Coloured labour belongs to the past, and our sincerest hope is that no attempt will ever be made to revive it in connection with our industry. Our desire is that it may be wholly a white man's industry, and it is this end that we are applying our individual energy and influence.' This sums up the most advanced and modern thought of the smaller and newer growers in Australia."

American Methods in Maize Culture.

In America a yield of 100 bushels of shelled mealies—equivalent to about 33 muids—to the acre is not unusual, though such a crop is a long way from the average taking the country as a whole. In remarking that the achievement of results like this is to be ascribed to cultural methods, the *Rural Californian* gives, in a recent issue, a brief description of the methods which the best growers employ to obtain such high yields. Among these, we learn, are deep ploughing and other treatment that aids to a thorough preparation of the soil; in advance of planting the making of germinal tests by selecting a number of kernels from an ear, and then selecting from them that sprout first and throw out the best stalks; the use of seed from large ears that have a small cob, in no case using kernels within an inch or more from the tips and butts of the ears, and taking pains to discover and throw out all defective or not fully developed kernels on the body of the ear.

"Apply a farm manure dressing broadcast," our contemporary proceeds, "and fertilise with the liberality required by each particular soil. It is a mistake not only in regard to corn [maize] but all other plants to force the roots to make search for food. Light cultivation from time to time as needed after the spears have grown to a half dozen inches in height. This treatment not only conserves moisture for the growing crop but for succeeding ones. Rotation from corn to some other crop is another. Choice of seed also from the best rows of corn in the field. It is some work to make the germination tests and select the best ears from the rows when large fields are to be planted, but the returns from it will be abundantly compensatory. These or similar methods should be applied in the selection of the seed of whatever plants, and the same culture as far as conditions will permit. In this way only can the best returns be realised. The methods prescribed are especially adaptable to garden vegetables. If followed faithfully there need be none of an inferior quality on the table."

A Method of Propagating Mangoes.

In connection with an article which appears in this number of the *Journal*, on shield budding for the mango, it is worthy of note that, according to *Agricultural News*, an account of another method for the propagation of this plant appears in the *Porto Rico Horticultural News* for February last. It consists in preparing one year old branches of the mango in the way that this is done for the same purpose in the case of carnations; that is, a tongue 3 inches in length is cut in the wood, and a small stone is inserted in order to keep the tongue away from the branch. All that remains to be done after this is to bury the cut part of the branch in soil, in a bamboo pot, which is kept watered. In experiments conducted by the writer, after ninety--six days, two out of six branches had formed roots and were cut from the parent plant. It is stated that a claim is made to the effect that trees propagated by this method yield fruit more quickly than by any other.

The Jerusalem Artichoke.

The Department of Agriculture has been informed by the Acting Agent-General in London that a process has been invented and patented by Professor Stewart, of Murraysville, U.S.A., for the manufacture of levulose, glucose, etc., from the common Jerusalem artichoke (*Helianthus tuberosus*), and for the manufacture of saccharine products which may either be concentrated into syrup or converted into alcohol. In a letter on the subject to the Acting Agent-General Captain Kerr, V.C., who is interested in the matter, says:—"These tubers can be used in a fresh condition as taken from the ground, or they may be dried after being sliced or ground to pulp. If left in the ground after the stalks are ripe they keep for long periods and do not suffer from frost. The stems are useful for paper-stuff. Hitherto these tubers have been only used as cattle food, and as garden produce, for the table, but can be grown to great advantage as a main crop. Levulose ranks next to cane sugar in value as a commercial product. We shall find this tuber a very useful rotation crop and it should grow well in Natal. They are excellent for the dairy."

Entry of Bark and Fruit Packing into Cape Colony.

The Department of Agriculture has been advised by the Minister of Agriculture, Capetown, that ground and chopped wattle bark will not be admitted into the Cape Colony from Natal; and, further, that consignments of fruit packed in other material than paper, paper shavings and wood wool will not be allowed entry. Senders of fruit, plants, and trees are particularly warned against the use of moss, hay, or grass in packing consignment for any destination within or beyond the Colony.



Photo by]

THE DAWN OF A NEW INDUSTRY.

[A. Moss, Dundee.

Group of Ostriches on Mr. Viljoen's farm, Dundee. In an early issue Mr. Viljoen will contribute an article on the ostrich industry, in the course of which he will give some useful advice to the intending purchasers of birds. Mr. Viljoen strongly advises all who may be thinking of going in for ostriches to purchase only young birds, about 18 months and not more than two years old (unless of course a man may have considerable capital and desires to go in for breeding immediately). His reasons he will explain fully in the article he is preparing.

The Advance of Agriculture.

By W. C. MITCHELL, Acting Manager, Central Experiment Farm, Cedara.

THE gradual evolution of agricultural practice in a country such as this would appear to follow more or less well defined lines. The early history of the soil's production reflects a pastoral type of farming; scanty population permits of large areas coming under single ownership; the lack of railway facilities and adjacent markets precludes the possibility of any development of the latent resources of the soil's fertility, and the "man on the land" is, therefore, by force of circumstances, a pastoralist. Such produce as can be walked to market is the principle agricultural staple, and the annual wool sale is looked upon, in the sheep districts, as a red letter day in the calendar, when a long trek and a considerable amount of bargaining often results in an exchange of the wool for a supply of household necessities calculated to meet all requirements till the next event of a similar nature.

Imperceptibly a change occurs, and increase of population brings with it a demand for land, which is partly met by sales of portions of former large estates or ranches; in addition, the increased population provides a corresponding increase in the amount of traffic. Material is required for the establishment of new homesteads and for the further development of occupied lands; this, therefore, sees the birth of the transport rider or carrier. With these increased facilities for carrying goods to market a gradual change occurs through bringing under cultivation limited areas of previously unbroken ground. By degrees the output in this direction begins to balance the demand until the necessarily high freight charges, incurred through existing means of transport, begets a need for some quicker, cheaper and more certain method of marketing produce, some of which, at least, is of a totally or partially perishable nature. The advent of railway facilities marks the commencement of a new era in agricultural activity. The districts immediately tapped by the rail constitute agricultural districts, whilst from these to the farthermost inland portions of the State, forming the truly pastoral or stock-raising localities, may be found a gradual merging from intensive agriculture to that of a less perfect nature.

Variations of, or exceptions to, the above, may be caused by various factors. The advent of a virulent stock disease—East Coast Fever to wit—which has decimated the country's cattle, exercises an influence towards the substitution of tillage for grazing as the only remaining means of obtaining a livelihood from the land in some districts.

It is not, however, with the advent of the "iron horse" that our tale of agricultural evolution ends. In agriculture, as in everything else, evolution is silently, slowly and surely at work, from the beginning to the end of all things. Competition is often the cause, and evolution the effect. The survival of the fittest militates towards the production of a better type. The *selection* of the fittest works much faster.

The factors determining the margin of profit in the production of any article are the economy, science and skill employed by the producer of the article, and in agriculture we probably have a vocation second to none for the possibilities it affords in the above directions.

Co-operation is synonymous with economy. As a local example the Natal Mealie Growers Union may be cited, whose operations in securing a reliable supply of fertilisers at a bulk rate for distribution to members, and grain sacks at a reduced price, has done much towards fostering the production of one of our principal agricultural staples.

Theoretically, a skilled agriculturist must embrace a knowledge of botany to assist in breeding selected types of plants; geology for a better understanding of the sources and needs of his soil; pathology to enable him to recognise and treat disease in animals and plants; entomology as a weapon for identifying and destroying noxious insects; this and other knowledge will always have calls made upon it. Practically, however, in place of the one man generalising in all these subjects each separate department has its specialists, men trained in their particular spheres and keeping abreast of modern methods by the interchange of discoveries and ideas, and placing their combined knowledge at the disposal of the farmer. This is another phase of co-operation—scientific co-operation—as distinguished from the commercial co-operation previously indicated.

There are, however, certain directions in which the farmer must to some extent be his own scientist and makes his own researches, principal among which is the treatment of his land for the production of crops. The main principles of tillage require modification to meet the needs of differing localities and conditions.

Of all the factors bearing upon the production from two given pieces of land the natural fertility of each may be considered the primary one, but modern science has indicated so many methods of assisting nature in the production of crops, that this question of "good" land is losing its relative importance.

The improvement of naturally poor land, and the maintenance of fertility in a soil that is yielding annual crops, demands treatment which may be included in one or other, or both, of two classes; treatment necessitating a direct outlay from the farmer's pocket, *e.g.*, the purchase of chemical fertilisers, or treatment, generally extending over a period of years, which does not necessitate any direct outlay. In this latter class

the following may be included:—Growth of leguminous crops; inoculating with soil bacteria; breeding improved types of corn; feeding crops on the land; and the introduction of improved tillage methods.

The term tillage, in this connection, is used to denote the mechanical treatment of the soil for the production of crops, embracing such practices as the Campbell system of dry-land farming and the reclamation of undrained areas. The object of tillage being to bring the soil into just that condition of air, moisture and heat which will be favourable to the presence and production of those soil organisms responsible for the breaking down of the plant food present, into a state in which it is available for the production of crops, it will follow as a natural sequence that the exact treatment required for the soil varies with the nature of that soil, and this is where the skill of the individual cultivator comes into play.

The Campbell system in principle consists in conserving the accumulation of water in the soil, obtained from a rainfall too slight to permit of raising profitable crops with the ordinary tillage methods, and it would appear that the ravages of East Coast Fever in Natal may permit of the introduction of a system calculated to possess some of the advantages of the dry-land methods.

The advantages of a dry winter for harvesting and drying a maize crop, when all operations can be conducted in the open without danger of damage by rain, cannot be overlooked, but at the same time disadvantages also attach to such a climate, accentuated considerably in seasons when spring rains are either exceptionally late or unusually scanty. The current season's maize crop has undoubtedly suffered to a considerable extent through late ploughing caused by the lack of rain in October. In the absence of cattle the necessity for retaining the mealie fields unbroken as winter grazing areas disappears, and it may therefore be expected that in many districts autumn ploughing will be generally adopted. Such a system renders the agriculturist independent of spring rains; the land will be sufficiently soft to permit of an early ploughing; the soil will receive a thorough æration during winter; the destruction of many hibernating insect pupæ will be effected by exposure to frost; suitable conditions for the activities of soil bacteria will be attained, and the surface mulch created by the autumn ploughing will greatly reduce the amount of soil moisture evaporated during the dry season.

The food supply of the young mealie is absorbed by the root hairs in a state of solution, therefore the amount of nourishment obtainable will be in ratio with the amount of moisture in the soil, up to a certain point, provided, of course, that the necessary root constituents are present in the soil in a soluble form.

To permit this autumn ploughing to have all the effect desired it

should be performed as early in the season as possible. As soon as the mealie crops are glazing the crop may safely be cut and placed in stooks; if these are arranged in parallel lines the intervening land may be immediately ploughed before its exposure to the sun has rendered it too hard for cultivation.

That East Coast Fever is not an unmixed evil is an expression voiced only by those who have not yet had the misfortune to suffer from its ravages, but if it indirectly evolve a better system of arable farming it may do much towards redeeming the damage it has wrought to Natal farmers.

Breeding from vicious parents will not produce the sort of horses that are desirable on the farm. Neither will trotting horses make good animals for agricultural purposes.

Veterinary physicians and surgeons advise washing the galled shoulders of the horse with a mixture of alum and water. This is soothing and cooling to the affected parts.

Don't put your horse away at night without examining his feet. A nail may have been picked up or a stone wedged in the cleft of the frog of the foot which if removed at once, will save serious trouble.

Every hen that does not pay for her keep by laying eggs should be sold at once. There are thousands of hens in the poultry yards that are losing money for their owners. Find out whether you have such hens, and, if so get rid of them.

The periods of incubation recognised as approximately correct are as follows:—Common hen, twenty-one days; pheasant, twenty-five days; duck, twenty-eight days; pea-fowl, twenty-eight days; guinea, twenty-five days; goose, thirty days; turkey, twenty-eight days.

The dairy cow should be persuaded to eat all she can. To this end, succulence is probably the cheapest and most satisfactory aid, and if to such a succulent ration the additional good qualities of easy digestibility and richness in protein be added, then the dairyman's problem is solved.

A Visit to a New Manure Works.

By W. R. SIMPSON LADELL, A.I.C., F.C.S., etc., *Chemist, Cedara.*

A SHORT time ago I had the pleasure of visiting Mr. G. J. H. Webster's factory for the manufacture of bone and refuse manures. Bone manure is much used out here, but refuse manures are very little known, and they are not appreciated as they should be.

Mr. Webster's works are situated near Bisley Station, and, although not very big, they are capable of dealing with considerably more material than is at present available.

The raw materials used are chiefly bones and offal from the Government Abattoir and from neighbouring farmers.

A necessary process in the manufacture of bone dust manure is the removal of fat, fat retarding the decomposition of the bones in the soil and having no fertilising value itself. For this purpose the bones are either boiled separately with water or are placed with hoofs, etc., in a digester of 750 gallons capacity, where they are submitted to a steam pressure of 40 to 50 lbs. per square inch. This treatment effectually sterilises all the substances, a very necessary particular where they have been obtained from diseased beasts.

Neatsfoot oil and gelatin are obtained as bye-products from this digester. The oil is run off into tanks where it is allowed to stand for some days under the influence of sunlight, which helps to clarify the oil. The clear oil is then run off from the sediment by means of taps in the upper parts of the tanks, and is ready for the market.

The bones, after passing through the digester, are quite white and as brittle as chalk. They are now put through a mill together with the other bones and are thereby broken up into small pieces. These pieces are put through a disintegrator, a machine working at the rate of 3,500 revolutions per minute, by which they are ground up to a powder. This machine is provided with a kind of cloth balloon which catches the fine dust and prevents waste. The material is finally sifted to separate the various grades of fineness, after which it is ready for use as a fertiliser. This bone-crushing plant can cope with 2 to 2½ tons of stuff per diem.

The hoof residues from the digester are placed with scraps of hide in a big ajeketp-an, through the double sides of which steam is circulated, thereby heating the contents of the pan. The mass is liquified and run off; after cooling and solidifying it is cut into strips which consist of glue.

In the manufacture of meat guano Mr. Webster is one of the pioneers in this Colony, but he possesses up to date machinery for this

purpose. All the fatty materials are placed in a digester of a similar type to that used for the treatment of bones and hoofs; here the mass is submitted to a moderately high pressure, sufficient to sterilise it effectually, but not high enough to extract a great deal of impurities with the tallow, and spoiling the latter by rendering it permanently dark in colour. The melted tallow is run off into tanks, where it is purified by floating on top of water after being liquified by means of steam coils. In this way most of the impurities settle to the bottom of the tanks and the purified tallow can be removed readily and sent off to the consumers. The residue after the extraction of the tallow is put into a drier along with various kinds of offal. The drier is similar in appearance to a horizontal boiler; it is provided with double jacket through which steam circulates and a horizontal shaft fitted with side arms which churn up the substances inside the machine. The heat of the steam drives off the water from the materials, and this is carried away by means of centrifugal fan. In this way all offal is soon reduced to a dry, friable mass which possesses excellent fertilising properties, containing, as it does, a good proportion of phosphoric acid readily available for plant nutrition, as well as useful organic matter and nitrogen.

All the machinery in the works is driven by means of two boilers, one giving 10 h.p. and the other 8 h.p.

I was much impressed by the care with which all the processes are carried out and by the general cleanliness of the works, the latter detail being all the more commendable when one considers the class of material dealt with.

Mr. Webster's factory should become the nucleus of a big and useful industry, and will help to hasten the time when this Colony will be almost entirely self-supporting.

Clean the cans just as soon as the milk is emptied, being careful to clean thoroughly about the seams. A good, stiff brush is the thing to use in this work.

The profitable production of any crop continuously on the same area is impossible. Sooner or later the yield will reach a point where the fixed charges will equal the value of the crop produced.

Avoid in-bred bulls, as in-breeding has a tendency to weaken the constitution, and, surely, if any class of cattle require a good constitution it is dairy cattle, from the nature of the demands made upon them.

Tanning in South Africa and its Drawbacks.

By A. LYLE.

I HAVE no doubt that to the observant man the thought must have often occurred: Why is it that there are few tanneries in South Africa capable of supplying the general requirements of the country, for, outside of the Cape Colony, tanneries, up to a year ago, were conspicuous by their absence; and what is the cause? I will endeavour to give what are, in my opinion, the chief causes for this want, and in expressing my opinions, I may state that I am guided by experience gained during the past twenty-five years, both as a tanner and in the harness-making trade. Tanneries have been established in the Cape Colony for a number of years, yet they are still unable to manufacture leather suitable for all requirements of harness and saddle work, and I am confident that they are suffering from some of the troubles I wish to deal with, as it has been proved that they are still unable to produce leather that would compare with second quality English tanned.

SOME OF THE DRAWBACKS.

In reciting some of the drawbacks that tanners have to contend with, I will commence with the raw materials. This, it must be admitted, is one of the most important essentials of any industry, for unless the raw materials that are to be worked up are suitable, it cannot be expected that a good article can be produced. The tanners have all along found it a difficult matter to secure good hides; by this I mean hides from well-grown bullocks, and why? Because bullocks in South Africa are not reared for any other purpose than transport, consequently they are made to work very young, and kept at work till too old for further use, or die of disease. During the period that the animal is at work it has very often to go long spells without proper food, and, during the severe winter months, is not able to get sufficient food to keep it in condition, consequently it becomes emaciated, and it naturally follows that the hide must suffer, and cannot be properly developed, being, in most cases, heavy in one part and very thin in another. Another factor which causes a deal of annoyance to the tanner is the scars on the hides caused by the heavy whips, used to extremes by the native drivers throughout South Africa. Were the effect of this method of punishing oxen better understood—that it depreciated the value of the hide to say nothing of its cruelty—I feel sure that some better method would be adopted.

INDISCRIMINATE BRANDING.

The next factor to which I wish to refer is the indiscriminate branding of cattle, and in this I feel that all those interested in the question will agree with me, and I am sure that some other method could be adopted that would be more serviceable, and at the same time not so cruel and damaging to the hide. I have often come across hides with brands quite a foot square, and it is needless to state that such hides are generally useless for leather. It often happens that the brand is placed on the rump of the bullock, and as this part of the hide is best, it will be readily understood that hides so branded are not of so high a value as those unbranded. Could not some method of branding on the horn or ear-marking be adopted? With regard to the ear-marking of cattle, I have been shown a very ingenious device, whereby cattle can be so marked with very little trouble and little hurt. I trust this system will be taken up by the Governments of the various Colonies, with a view to its adoption. When the farmers of South Africa realise the necessity of raising cattle for the value of the beef and hide, then we can rest assured the tanner will, in a great measure, be able to produce a better article.

FLAYING AND DRYING.

Another factor which gives tanners just cause for complaint, and which I feel safe in saying involves a loss of hundreds of pounds per annum, is the careless flaying of the hides. Butchers, as well as farmers, should make a special note of this. So far as I can gather Natives are used solely for this work, and they have not the least idea as to the damage they are causing when making large gashes in the hides they are flaying. I am led to understand that this matter was taken up in Australia, with the result that the Government appointed inspectors, and fines were inflicted for each cut found on each hide. I trust my remarks on this subject will be taken seriously by those concerned.

There is another question, which to my mind could be easily rectified, that is the method of drying hides. The usual method adopted by the farmers and country butchers is to lay the hide out in the sun to dry, remaining out all weathers till ready to be packed away. I would point out that should rain come on while the hides are out drying they are not taken in, and the result is that a certain amount of rain-water is collected in the hide, and when the sun appears this water is absorbed, causing damage to the hide. I would suggest that all hides or skins, after being flayed, be laid out in a shed, and a light sprinkling of coarse salt be thrown over the flesh side, and allowed to remain for, say, a day or two, then hung over beams in a shed to dry. By this method, I can assure all concerned, they would reap an advantage.

Now to come to the question of water for tanning purposes. Some have the idea that any water will do. This is a great mistake, as water,

though pure to look at, may be highly charged with organic matter, and is then altogether unsuitable for tanning purposes. Water that has the slightest taint of iron is also most unsuitable, and should water of this description be used it will be impossible to produce leather of a good colour without the use of a chemical.

CARELESSNESS IN TANNING.

The chief reason why tanners have not been successful in South Africa is the fact that they are over anxious to sell their productions, not caring whether they be good, bad, or indifferent. We shall agree that if one expects to make a success of any industry, there are certain ends that must be attained, and when once attained must be maintained. The first is quality. Many people have an idea that an industry has only to be started, and success is assured. But I fear many have found this to be a fallacy, because the public is not prepared to support any industry that cannot supply an article near or equal to the imported, even should the cost be a trifle less.

Many have the idea that the old method of tanning, wherein it was considered necessary that certain hides should take twelve months to undergo the process of tanning, is the best. I must admit that when I have used leather that has been tanned by this process I have found it to be of far better quality than that tanned in a shorter period. I refer particularly to leather for harness-making and sole leather; lighter leathers, naturally, do not require such a lengthy process as I have mentioned. The longer the period that hides are allowed to remain in the tan liquor the better the results, yet some tanners expect to have leather suitable for harness-making after three or four months. Naturally the leather is unsatisfactory, and cannot give satisfaction, either to the man who works it into harness or the man who has to use the made up article. I should point out that the action of the tannic acid is to strengthen the fibres of the hide, and the longer it remains in the tan the greater the strength, at the same time adding to its pliability in the currying process. It is important that the materials to be used be pure and of good quality, and I strongly condemn the forcing process used by the tanners. The greatest care should be exercised in providing proper ventilation in the drying-rooms. Unfortunately this has not been considered in the many tanneries I have seen, any shed that has a roof over it sufficing for the purpose. Can we wonder, then, that tanning has not been the success it should?

I have often been asked whether it would be possible to manufacture all the various materials required in the making of boots and shoes in South Africa. I fear that to this I must give an answer in the negative. Climatic conditions alone render it impossible, besides which some of the finer leathers that are used in the manufacture of boots are peculiar

to the country in which they are made. Yet for the general purposes of this country suitable leather can be turned out, and I have seen very good quality leather supplied from one of the Cape tanneries. The trouble is, that so far as I can learn, the supply is not equal to the demand.

The amount of leather that is now being imported into South Africa amounts to many thousands of pounds, and the Australians are supplying a very large proportion of this amount, but in Australia cattle are reared almost solely for the beef and the hide, and were it possible for the tanners in South Africa to procure hides equal to the Australian, we could hold our own against that country.

I trust that should I have had occasion to give some hard knocks, they will be taken in the spirit in which they are meant. I have but one object in view, that being an endeavour to get all concerned to do their utmost towards improving the condition of the cattle, and to influence the butchers to take greater care in the flaying.

Keep a small box of wood ashes or charcoal where the hogs can get at it. It will do wonders toward keeping them healthy and their digestions strong. A little attention to matters of this kind will result in a more thrifty growth and quicker fattening.

A cement milk tank is the latest use to which cement has been put. It can be built in one corner of the cellar or milk-house. The water will remain cool much longer in it than in the old-fashioned wood tank, and it will be impossible for germs to hide in the pores.

For concrete floors, mix thoroughly with water three parts of sand to one of cement, add five times the bulk of cement in fine stone, and mix again. After spreading, tamp with a base ten inches square until the water appears on the surface. Smooth the surface and let dry for five days.

The best cow, regardless of her type or conformation, is the one that produces the most butter fat from a given amount of food without improving her vital forces.

The dairy farm is universally considered the most prosperous farm. But the dairy farmer can not realise the fullest extent of prosperity unless he makes good use of the by-products.

Botanical Analyses of Veld Herbage.

By J. FISHER, BIOLOGIST, CEDARA.

I.

Report upon the Botanical Analysis of the Veld Herbage, from virgin land on the Railway side at Winkle Spruit, made during March, 1910.

THE manner of procedure was the same as that adopted in the analysis of the veld herbage in the Dairy paddock at Cedara. Nine square feet were taken, each square foot being separate from the others, and each as thoroughly representative of the herbage as possible. The vegetation was entirely removed from each separate square foot, and the different species of grasses, etc., were separated. Owing to the fact that there was no chemical balance available the different species were parcelled up and the weighings have been done here at Cedara.

The herbage will, therefore, be somewhat drier than that from which I made the former analysis, but this will not affect the percentages of the various species. The only difference will be noted in the total weight of herbage calculated from one acre.

The details of the investigation are as follows :—

No. 1.—Area taken, 1 sq. foot. Total weight of herbage, 79·9 grams, made up as follows :—

Andropogon schirensis, 11·51 grams.
Andropogon hirtus, 13·3 grams.
Andropogon ceresiaeformis, 10·75 grams.
Aristida junciformis, 14·72 grams.
Undetermined gramineous herbage, 24·03 grams.
Leguminous plant sp. ? 5·59.

No. 2.—Area, 1 sq. foot. Total weight of herbage, 66·62 grams, constituted thus :

Aristida junciformis, 26·77 grams.
Panicum laevifolium, 1·0 grams.
Panicum sp., 1·85 grams.
Andropogon nardus, 5·58 grams.
Andropogon ceresiaeformis, 9·01 grams.
Andropogon schirensis, ·80 grams.
Undetermined graminous herbage, 18·1 grams.
Leguminous plants sp., ·97 grams.
Helichrysum sp., 1·29 grams.
Lobelia sp., ·85 grams.
Miscellaneous plants, ·40 grams.

No. 3.—Area, 1 sq. foot. Total weight of herbage, 89·94 grams, made up of :—

Andropogon ceresiaeformis, 9·75 grams.
Andropogon schirensis, 39·05 grams.
Andropogon hirtus, 5·81 grams.

Andropogon auctus, 2'20 grams.
Paspalum scrobiculatum, '97 grams.
Panicum laevifolium, 7'69 grams.
Aristida junciformis, 4'78 grams.
 Undetermined gramineous herbage, 16'50 grams.
 Leguminous plants sp., '62.
Helichrysum sp., 2'06 grams.
 Miscellaneous plants, '51 grams.

No. 4.—This sample was taken from the veld at the back of the Experiment Farm Winkle Spruit, and was rather old for proper examination. Total weight of herbage—36'45 grams :—

Anthisteria imberbis, 11'22 grams.
Aristida junciformis, 14'75 grams.
Scripus sp., 1'26 grams.
 Undetermined gramineous herbage, 9'22 grams.

No. 5.—Area, 1 sq. foot. Total weight of herbage, 52'48, as follows :—

Andropogon ceresiaeformis, 6'37 grams.
Andropogon schirensis, 4'50 grams.
Andropogon auctis, 3'16 grams.
Aristida junciformis, 13'80 grams.
 Undetermined gramineous herbage, 15'38 grams.
Fimbristylis sp., 5'32 grams. Identified by Mr. Medley Wood.
Leguminous Indigofera sp., 2'85 grams.
 „ Undetermined, '38 grams.
 Miscellaneous plants, '72 grams.

No. 6.—Area, 1 sq. foot. Total weight of herbage, 71'48 grams .—

Andropogon ceresiaeformis, 10'57 grams.
Andropogon schirensis, 8'80 grams.
Andropogon hirtus, 18'38 grams.
Aristida junciformis, 12'70 grams.
 Undetermined gramineous herbage, 16'75 grams.
Fimbristylis sp., 1'66 grams. Identified by Mr. Medley Wood.
 Leguminous plants—
 Indigofera sp., 1'31 grams.
 Leg. unknown, 1'31 grams.

No. 7.—1 sq. foot. Total weight of herbage, 109'11 grams :—

Andropogon hirtus, 7'7 grams.
Andropogon ceresiaeformis, 18'32 grams.
Andropogon amplexens, 6'29 grams.
Andropogon nardus, '79 grams.
Andropogon schirensis, 17'23 grams.
Aristida junciformis, 35'95 grams.
 Undetermined gramineous shoots, 21'26 grams.
Leguminous caesia sp., '67 grams.
 Miscellaneous plants, '9 grams.

No. 8.—1 sq. foot. Total weight of herbage, 88'39 grams, as follows :—

Andropogon ceresiaeformis, 8'46 grams.
Andropogon amplexens, 11'32 grams.
Andropogon schirensis, 1'25 grams.
Andropogon hirtus, 13'87 grams.
Aristida junciformis, 25'68 grams.
Eragrostis major, 1'17 grams.
 Undetermined gramineous herbage, 25'51 grams.
 Miscellaneous plants, 1'13 grams.

No. 9.—Area, 1 sq. foot. Total weight of herbage, 79'12 grams :—

Andropogon schirensis, 7'55 grams.
 Andropogon cerasiaeformis, 14'07 grams.
 Andropogon amplexans, 6'43 grams.
 Aristida junciformis, 13'22 grams.
 Undetermined gramineous herbage, 26'02 grams.
 Carex sp., 4'06 grams.
 Leguminous sp., 7'77 grams.

The total weight of the herbage per acre would be —

3 tons 4 cwt. 0 qrs. 3 lbs.

The Gramineae constitute	93'82	per cent. of the total herbage.
The Leguminous plants constitute	3'18	„ „ „ „
Miscellaneous plants constitute	3	„ „ „ „
Total	100	„ „ „ „

Of the total gramineous plants, the following are the percentages of the various species :—

Aristida junciformis,	25'69 per cent.	Andropogon nardus	1'00 per cent.
Andropogon schirensis	14'35 „	Andropogon auctus	'84 „
Andropogon cerasiaeformis	13'81 „	Panicum sp.	'28 „
Andropogon hirtus	9'34 „	Eragrostis major	'18 „
Andropogon amplexans	3'80 „	Paspalum scrobiculatum	'15 „
Anthistria imberbis	1'77 „	Undetermined grami-	
Panicum laevifolium	1'37 „	neous herbage	27'34 „

The Leguminous plants constitute only a small percentage of the natural veld, and only two determinate genera were represented. These were :—*Indigofera* and *Caesia*. The other plants were not able to be identified.

The family *Compositæ* were represented by the genus *Helichrysum*, and the family *Campanulaceæ* by the genus *Lobelia*; the *Cyperaceæ* are represented by *Scripus*, *Carex*, and *Fimbristylis*.

II.

Report upon the Botanical Analysis of the Veld Herbage from the Farm "Riversdale," Howick, on the occupation of Mr. Geo. Ross

The method of procedure was the same as that at Cedara and Winkle Spruit.

The investigation was commenced on the 16th of February, 1810. On this date three separate samples each from 1 sq. foot of land were taken, and the contents separated. Owing to my being called away down to Winkle Spruit no further samples were taken till April 1st, 1910, on which date six more samples were taken, thus making the same number of samples as taken from the veld at Cedara and Winkle Spruit.

The details of the investigation were as follows :—

No. 1.—Area, 1 sq. foot. Total weight of herbage, 153'78 grams :—	
Trachypogon polymorphous	21'17 grams
Tristachya leucothrie	1'55 „
Anthistria imberbis	13'12 „
Eragrostis chalcantha	8'3 „
Harpechloa capensis	0'4 „
Undetermined gramineous herbage	86'75 „
Lathyrus sp.	12'32 „
Undetermined leguminous herbage	6'05 „
Miscellaneous plants, 4'12 grams.	

} Gramineæ.

} Leguminosæ.

No. 2.—Area, 1 sq. foot. Total weight of herbage, 149'69 grams:—

Andropogon amplexans	37'22 grams	} Gramineæ
Tristachya leucothrie	77'11 "	
Anthistiria imberbis	12'07 "	
Eragrostis brizoides	10'5 "	
Undetermined gramineous herbage	8'1 "	} Leguminosæ.
Undetermined leguminous herbage	1'5 "	
Miscellaneous plants,	3'19 grams.	

No. 3.—Area, 1 sq. foot. Total weight of herbage, 166'38 grams:—

Andropogon amplexans	68'28 grams	} Gramineæ.
Tristachya leucothrie	57'82 "	
Undetermined gramineous herbage	34'51 "	
Miscellaneous species,	5'77 grams.	

No. 4.—Area, 1 sq. foot. Total weight of herbage, 102'2 grams:—

Anthistiria imberbis	70'70 grams	} Gramineæ.
Andropogon hirtus	11'35 "	
Andropogon amplexans	3'70 "	
Digitaria diagonalis	11'56 "	
Mycrochloa caffra	1'66 "	
Undetermined gramineous herbage	3'23 "	

No. 5.—Area, 1 sq. foot. Total weight of herbage, 129'76 grams:—

Anthistiria imberbis	93'7 grams	} Gramineæ
Andropogon nardus	10'4 "	
Andropogon hirtus	6'8 "	
Digitaria diagonalis	5'19 "	
Tristachya leucothrie	7'3 "	
Undetermined gramineous herbage	12'94 "	

No. 6.—Area, 1 sq. foot. Total weight of herbage, 60'90 grams:—

Anthistiria imberbis	47'5 grams	} Gramineæ.
Andropogon hirtus	3'27 "	
Andropogon nardus	2'73 "	
Andropogon amplexans	2'21 "	
Undetermined gramineous herbage	3'62 "	} Leguminosæ.
Undetermined leguminous plants	1'57 "	

No. 7.—Area, 1 sq. foot. Total weight of herbage, 100'28 grams.

Anthistiria imberbis	90'55 grams	} Gramineæ.
Eragrostis brizoides	5'9 "	
Undetermined gramineous herbage	3'83 "	

No. 8.—Area, 1 sq. foot. Total weight of herbage, 86'12 grams:—

Anthistiria imberbis	78'20 grams	} Gramineæ
Undetermined gramineous herbage	2'15 "	
Undetermined leguminous plants	5'77 "	

No. 9.—Area, 1 sq. foot. Total weight of herbage, 133'30 grams:—

Andropogon hirtus	55'15 grams,	} Gramineæ
Anthistiria imberbis	48'22 "	
Setaria sp.	19'57 "	
Microchloa caffra	1'12 "	
Undetermined gramineous herbage	9'24 "	

The total weight of the herbage per acre would be—5 tons 2 cwt. 3 qrs. 17 lbs. This is less than 1 cwt. per acre more than from the veld at Cedara, but nearly 2 tons per acre more than that at Winkle Spruit.

The *Gramineæ* constitute 96·27 per cent. of the total herbage. The Leguminous plants constitute 2·51 per cent. of the total herbage; whilst the Miscellaneous plants constitute 1·22 per cent. of the natural herbage.

Of the Gramineous plants the following are the percentages of the various species :—

<i>Anthistiria imberbis</i>	43·57 per cent.	<i>Eragrostis brizoides</i>	1·57 per cent.
<i>Tristachya leucothrie</i>	13·16 „	<i>Andropogon nardus</i>	1·26 „
<i>Andropogon amplexens</i>	10·69 „	<i>Eragrostis chalcantha</i>	·79 „
<i>Andropogon hirtus</i>	7·34 „	<i>Microchloa caffra</i>	·26 „
<i>Trachypogon polymorphous</i>	2·03 „	<i>Harpechloa capensis</i>	·03 „
<i>Setaria</i> sp.	1·87 „	Undetermined <i>gramineæ</i>	15·77 „
<i>Digitaria diagonalis</i>	1·60 „		

The Leguminous plants are fewer than was the case down at Winkle Spruit, and the genera were, in all cases except one, indeterminate. The Miscellaneous plants are also fewer than in the veld at Winkle Spruit.

The last six samples were taken from what is termed blue grass veld, owing to the glaucous tint which the herbage presents. Most of this, however, was not made up of the true blue grass (*Hydropogon hirtus*), but, as a glance at the percentages will show, of another grass (*Anthistiria imberbis*), the leaves of which often present the same bluish tint as the well known blue grass. The grass *Athistiria imberbis*, is the one which was the most represented in the veld here at Cedara.

Pigs suffering from scours may be helped and many times cured by feeding them a little boiled milk in which has been placed a pint of scorched flour to each gallon of the boiled milk.

If you are after a profitable sow, better not pay so much attention to the number in the herd book as to good bone, good constitution, and big litters.

No orchard will thrive on undrained soil. Drains should be run between rows of trees of fifty feet apart. Put them down deep enough to prevent damage from frost.

It is a mistake to feed all sizes of pigs together, especially when the smaller ones are to a disadvantage.

Top Working Fruit Trees.

By O. B. WHIPPLE,

Field Horticulturist, Grand Junction, Colorado.

(Continued from Page 376.)

CHOOSING THE STUBS.

THERE is much to be gained by the proper selection of stubs into which scions are to be set. A too common practice is to remove the whole top the first year and graft all the stubs. It is surprising that some good results come from such a practice. More often, however, this proves too much for the tree and it fails even after the grafts have made a good start. They may linger two or three years and then die from no other cause than the severe cutting back, though the growers are prone to attribute it to some other affliction. The cutting away of the greater part of the top seems to give good results and may even be advisable in top-working stone fruits. The pear will stand much more abuse in this respect than the apple. A far better plan, in all cases, is to cut away only enough limbs to set scions for a good top. This will generally be about half of the tree, as six stubs will, in most cases, provide for a good top. The working of more stubs results in too dense a top or necessitates their removal later. The remaining limbs may be shortened, but some foliage is needed to protect the stubs and trunk from sun-scald as well as to supply nourishment. If the stubs are well chosen the remaining limbs will do much to protect the young grafts from wind and especially from being brushed out by passing teams and orchard machinery. It is well to choose inside limbs for grafting as they are best protected, but care must be taken not to contract the head of the tree too much. It should be borne in mind that top-worked trees tend to grow upright, but it is a difficulty which may be largely overcome by judicious pruning.

After the scions have made one year's growth much of the remaining top may be removed, but it should seldom all be removed from old trees before the second year. If some stubs have met with accidents or have failed to start the scions, or if the shape of the tree or a scarcity of scaffold limbs has prevented a full top being placed the first spring, it may be completed the second.

While we sometimes see grafts doing nicely in stubs six inches in diameter, it is very doubtful whether such grafts will make a strong union or a long-lived tree. The wisdom of working limbs over three inches in diameter is to be doubted. In the choosing of stubs the grafter

should remember that large wounds properly made heal more readily than large stubs. Choose the smaller limbs for grafting even though the later removal of the top may necessitate the cutting of larger limbs lower down. It is better to raise the head of the tree than to work large stubs. The ideal time for grafting is just as the buds are beginning to swell. While scions may be set earlier, there is danger of their drying out before a union is established. Should one care to prolong the season, it is better to run late than to begin early. Some go through the orchard in winter and remove the tops of the stubs that are to be grafted, cutting them at least a foot above where the scions are to be placed. This saves some time, and by hauling the brush out before the grafts are set it saves some of them from being knocked out by careless men in removing it later. When ready to graft, the stub is recut from a foot to eight inches lower.

PROTECTING THE BODY.

Since the removal of any considerable part of the top often exposes the body of the tree to the direct rays of the sun, it is well to whitewash the trunk and main branches. The whitewash reflects the rays of the sun, and by such an application many cases of sun-scald may be avoided. A good whitewash may be prepared by using one pound of good quicklime to each gallon of water. The addition of a pound of salt to each three gallons of the wash tends to make it stick better. This can best be applied with a spray pump. A good coating can only be secured with two applications, the second to follow as soon as the first is dry.

SCION-WOOD.

In this connection it is well to say a word about the selection of scion-wood for grafting. The man who is interested in his bearing orchard has early learned that the individual trees in the plantation show a great variation, especially in productiveness, and very often in the size, colour and quality of the fruit. Some of this variation may be accounted for in various ways, but, after all, we are coming to believe that, environmental conditions being equal, no two trees are alike in bearing habits. It is a natural variation. There are trees that never bear well and scions from such trees will, no doubt, produce trees very much like them. In the selection of grafting wood it is well to bear this in mind. Mark your favourite trees and select scion-wood from them.

The wood used should be one year old, strong and well matured, but not overgrown. The terminal shoots from trees that have made a growth of from twelve to eighteen inches make excellent scions. The question is often asked as to the use of watersprouts. The term watersprouts may mean different things to different people. By watersprouts we generally mean rank growth from adventitious buds; and such growth with immature tips, weak buds far apart, and pithy centres make very poor scion

wood. Otherwise, any new wood with well-developed buds, comparatively close together, may be used for scions. The statement sometimes made that watersprouts never produce fruit is erroneous.

Scion-wood should be gathered in the autumn, preferably as soon as the leaves have fallen, and stored until spring. The object is not to avoid winter injury, as some think, but to keep the scions in a dormant condition. Few realise that buds complete the resting period early in the winter, and may, under favourable conditions, begin to swell before the winter is over. The object of keeping the scions dormant is to allow time for a partial union before the buds are started into growth by the warm days of the grafting season. Scions with buds well swollen often throw leaf surface before a sufficiently strong union has been made to support them. The result is the exhaustion of the stored-up food supply and moisture of the scion to a point which may cause its death.

The scions may be stored in sand in a cool corner of the cellar or buried out of doors. The main object is to keep them cool and moist and away from fluctuating temperatures. An excellent plan is to bury them on the north side of a building or in some spot shaded most of the day. they need not be buried deep, from twelve to eighteen inches being sufficient in a well-shaded spot.

GROWING THE TOP.

It would hardly seem wise to leave the subject of top-working old trees without some comment on future treatment of the grafts. The setting of the scions is only the first step in working over the tree. Should we stop here, a most miserable failure, or, at least, a poor top would be the result. Many a good catch is ruined by neglecting the pruning the first two seasons. During the first season the grafts should make a very rank growth, and they will require some pinching back to save them from becoming top-heavy and consequently easily blown out. The common practice is to head-in the rapidly growing shoots when they have attained a length of from eighteen inches to two feet. This forces branches from below, and if growth becomes too heavy these may need cutting back before the season is over. This pruning insures stockiness of the new growth and throws much of the energies of the top into a good union. The growth of suckers or watersprouts from the stock should not be allowed to any great extent. Should the stubs be exposed to the direct rays of the sun it is well to leave some of this growth, pinching it back to cause it to form a dense shade. Unless needed for protection it is well to rub the sprouts off as fast as they appear.

The following spring the system of pruning should resemble very much that of pruning young trees. The growth of the grafts should be cut back to usually not over eighteen inches in length. They may be cut even shorter if the growth has not been satisfactory. If all three buds

have started from a scion, it is well to remove all but one to avoid crowding. As a rule the growth from the lower bud will be the strongest and should be retained. Should the formation of the top allow it, a second growth may be left. If the grafts have been set in near the head of the trees they will require some pruning in reference to spreading the top. The general tendency is for the top-worked tree to grow too compact. Cut the grafts back to one of the strong outside branches started by the first pinching back, and it will give them a start in the right direction. What shall we do where the scions start in the same stub? Should the stub be less than three inches in diameter one should be removed at this time. Keep the stronger, or if there should be little difference, the one best situated to help make a good top. Cut the other off close, even to removing a small corner of the stump on that side, the wound will heal better. Should the stub be over three inches in diameter there is some argument in favour of leaving the extra graft another year. It will help callous over the stub, and may be removed the following spring, leaving a comparatively small wound. If left longer, or until the two grow together, the result is a bad crotch and sometimes a pressure which may actually split the stub.

Subsequent pruning will consist in such cutting back as will help form a stocky and well-shaped top. They will demand the same attention as young trees. Spread the top by pruning to outside buds or branches and do not pay too much attention to the small wood. Some of the small branches may require cutting out or clipping back, but, remember, in it we have the start for early fruiting wood.

TOP-WORKING YOUNG TREES.

There is a growing conviction among the fruit-growers that better results may come from planting vigorous young trees of some strong, growing kind to be later worked over to the desired variety. In the opening remarks on this subject, mention was made of the desirability of working weak-growing kinds on stronger root-systems, as well as top-working as a means of lessening loss from attacks of root rots and woolly aphis. The embarrassment of growing the orchard to a bearing age only to find some of the trees not true to name may be avoided by this plan of starting the young orchard. Then every fruit-grower has observed that few trees of the same variety are alike in bearing habit and character of fruit. No doubt, many growers have some particular tree in their bearing orchard which is better than all others, that is nearer their ideal. By choosing grafting wood from this tree, a young orchard may be grown as near like it as is possible. There are productive and unproductive trees in every orchard, and the careful selection of scions from productive trees will avail much as a means of building up a fruitful orchard.

In top-working young trees it is a common practice to set the trees

where they are to grow, and, after the scaffold limbs are well formed, to graft or bud into these the future top. Some Eastern men have advocated purchasing two-year-old trees in the fall (trees in which the head is already formed) to be grafted over indoors in December.* In the West, and especially on a large scale, this system would hardly seem practical. The method of grafting in this case is whip-grafting.

GRAFTING.

In grafting young trees in the field it is probably well to do it as early in the life of a tree as possible. As soon as a good strong framework can be secured the tree is ready for top-working. The small size of the stubs make cleft-grafting difficult and kerf-grafting almost out of the question. Some growers, however, report good success in cleft-grafting young trees after two years' growth from a yearling whip. In this case the stubs must be bound with waxed cloth or other material to hold the scion firmly, and then waxed as in cleft-grafting larger stubs.

Another style of grafting, known as whip-grafting, is well adapted to working these small stubs of young trees. With this style of grafting it may be possible to set the scions after one year's growth in the field, but it is doubtful whether much time will be gained by such practice. The scion should be as near the size of the stub as possible, if anything, a little smaller. The cambium of the stock and scion is matched only on one side, paying no attention to the other. The joint should be well wrapped with waxed cloth, and, to be doubly sure all air is excluded, may be painted over with a warm wax.

In grafting young trees it is a common practice to remove all of the top, placing scions in those arms one wishes to keep. It is always well to work a few extra stubs as accidents may befall some of the scions. The season for top-grafting the young trees is the same as for old trees. While top-working the old trees tends to hasten the bearing of the scions, it is doubtful whether top-working young trees induces earlier fruitfulness.

BUDDING.

This is no doubt the simpler method of putting a new top on young trees. While the process of budding is a little more delicate than that of grafting, the average man can, with a little practice, get very satisfactory results. Buds should be placed as soon as the top is well formed, setting one or two in each scaffold limb that is to be retained. The buds are generally set from six to twelve inches from the main stem, depending on the formation of the head. Trees two years old when set may generally be budded the following fall, and should yearling whips make a strong growth, the arms may be large enough to receive buds in

* Corresponds to June in Natal.—ED.

September.† Any stem as large as a lead-pencil may be budded quite easily. Arms in which buds fail to start may be grafted the following spring. Should arms fail to appear in the proper place it is quite possible to supply them by setting buds directly into the body of the young tree. When the buds begin to push into new growth they will require about the same care as young grafts. They will need some pinching back to strengthen the stem and to overcome the tendency to become top-heavy. With the possible exception of young trees budded in late spring, all growth from the original stock should be removed as fast as it appears.

Buds may be set during the month of June [December] or early July [January], or in August [February] and September [March].* For June [December] budding the bud-sticks are cut as soon as well matured wood may be found. Good firm wood with well developed buds may generally be cut from bearing trees in the latter part of June [December]. As soon as buds set in June or July [December or January] unite with the stock, the bandage is cut and the part of the stock above the bud is removed. In spring-budding it is well to leave some of the new growth which springs from the arms below the bud. This takes the surplus sap and help nourish the roots until the buds are well started. Wood from buds set in the spring may not mature well in our climate and is susceptible to winter injury during severe winters. With careful watering it is possible to mature the wood properly, but where practical, fall budding should be given the preference. In the case of peach trees, June [December] budding is preferred where attacks of twig borers often destroy in early spring buds set the previous fall. In the apple and pear it is probably more convenient to bud in the fall. Then, too, arms which are large enough to bud in early spring were large enough the previous September [March], so one really gains rather than loses time by budding in the fall.

In fall budding the buds are taken from the current's year's growth. Buds may be inserted in wood of one, two or three years' growth. The stiffness of the bark of the other wood makes budding difficult. The heavy bark not only makes the insertion of the bud difficult, but in drying out it curls away from the bud exposing it to the air. The simplest form of budding is that known as Shield-budding or T-budding. The position for the bud is chosen with reference to the prevailing wind, protection from the sun's rays, or to best form the top of the tree. The most important factor should determine where the bud should be placed. It is well to place the bud on the shady side of the stock, if possible. Should the locality be subject to strong prevailing winds, the bud should stand more wind if placed on the side of the stock toward the wind. A

† *i.e.*, About March in Natal.—ED.

* Corresponding Natal months are shown in brackets.—ED.

T-shaped incision is made in the bark and the corners of the bark below the transverse cut raised to facilitate starting the bud. The bud is then cut from the bud-stick by starting the knife half an inch below the bud, cutting under and to about the same distance above the bud. This gives a long bud which is especially desirable in a dry climate. In cutting under the bud, the knife should be run deep enough to leave a small shield of wood. Fig. 7 will show the various steps in the process of shield-budding. A simpler method of lifting the bud, at least for the beginner, is to start the knife as before, and cut sharply into the wood to about one-third the diameter of the stick and then upward under the bud, making a tongue about an inch long. The knife is then run across the tongue half an inch above the bud, cutting through and lifting the bark at this point. The bud is then grasped between the thumb and first finger and lifted, leaving the wood on the stick, as shown in the same figure. While the removal of the wood from under the bud is no particular advantage, the method is simpler and gives the inexperienced budder a larger per cent. of good buds. The writer has lifted thousands of buds in this manner with the best of success. It is difficult to cut buds in this way from some varieties of cherry and plum trees with thin bark, but it works well on the apple, pear, peach, apricot and the heavy-barked plum. The bud is then slipped into place as shown in the figure and well wrapped with raffia or soft wrapping twine. About four wraps below and three above, so spaced as to close the whole opening, is sufficient. In wrapping, the common practice is to start below, and by crossing over the first end and running the last end under, the bud is wrapped without a knot. The tying material is usually cut in the desired lengths beforehand, and if raffia is used, it should be kept moist, as it ties better.

If on healthy young wood, the buds will unite within ten days or two weeks. Then the wrapping should be cut by drawing a knife across it on the side of the stock opposite the bud. Should the stock be making a slow growth, there need be no hurry about cutting the tie. The only thing to be guarded against is that the wrap does not cut into the bark. This pressure interferes with the flow of sap, and tends to throw the bud into premature growth; this often means a loss of the September [March] bud. The bud set in August and September [February and March] should remain dormant over winter. The following spring, just as soon as the buds on the top of the stock begin to push out, the original top of the stock is cut away. Should the stock be cut off too early in the spring, or too close, there is danger of the stub drying out to the injury of the bud. Some recommend the practice of leaving a longer stub to which young growing shoot from the bud may be tied until it is well established. This saves some buds from being blown out, but necessitates a second cutting in mid-summer to allow the stub to heal over.

We have said that buds for fall budding should be taken from the

current year's growth. The common practice is to cut the terminal growth from bearing trees. The leaves are trimmed off at once, leaving a small part of the leaf-stalk to handle the bud by. Bud-sticks trimmed in this way may be stored in a cool, damp place and kept for some time without injury. The leaf-stalks, however, will loosen and drop off in many cases if stored over ten days. Of course, this does no harm, but some budders miss the little handle in inserting the bud. The first few buds at the base of the stick are generally poorly developed and should be discarded while those near the tip are too immature to be used. As a rule not over half of the new growth cut in early September [March] will carry buds suitable for budding. The sticks should be carried in a damp cloth to avoid drying out.

AN IMPERISHABLE GARDEN LABEL.—Garden lovers will welcome a new, handy, and ingenious remedy for avoiding the trouble concerning name-tags and tallies of rose and fruit trees. The ordinary means to this end are far from satisfactory, the greatest disadvantage being that the names become easily and quickly obliterated by the weather. With the new label, however, no such drawbacks are possible, inasmuch as the name is indelibly printed beneath the glaze of a small tag of porcelain. The tally is light and substantial, capable of withstanding frosts, the glaze will not crack, and the imprint cannot possibly fade or become defaced as it is burnt in. The tag is attached to the tree by a small piece of specially annealed aluminium wire, which is rust-proof, and will not cut the bark. One great advantage of the novelty is that the tally is always clean, since it is washed by the rain, and will look as good as new after several years' service. The names of over one thousand rose trees are available on this type of label, and a wide variety of fruit names are also prepared. It can, moreover, be obtained in other forms for slipping into the open ground in pots. Another notable feature which should appreciably influence their widespread use is their inexpensiveness, especially when it is remembered that absolute durability is secured. This new label completely solves one of the greatest sources of annoyance to the gardener, be he professional or amateur.—*World's Work*, February.

Cement and Concrete Fence Posts.

By H. M. BAINER and H. B. BONEBRIGHT.*

Continued from page 385.

REINFORCEMENT.

Cement and concrete work has the property of resisting great crushing stresses, but when subjected to tensile stress, the best of it breaks very easily.

For this reason it becomes necessary to put some material possessing great tensile strength into the post, in order that the full crushing strength of the cement or concrete may be utilised. Iron is the most satisfactory material from which to make the reinforcement.

The reinforcement should be placed in the post as near the corner as possible. This places it as far as possible from the neutral axis, thus giving it the greatest advantage in strengthening the post. In order that the reinforcements may be properly held and protected by the cement, it is a good plan to place it from $\frac{3}{8}$ to $\frac{3}{4}$ inch in from each side. This insures a good, firm grip of the cement upon the reinforcement.

The material used for reinforcement should be strong, light, and rough enough to permit the mixture to get a firm grip upon it. It should be very rigid, with little or no tendency to spring or stretch.

A great many special reinforcements are now being made, but the farmer should see to it that the reinforcement which he is to use is reliable, rigid, and easily secured.

The experiment showed that ordinary iron or steel wire was cheapest, strongest and easiest to procure. In order to provide a means by which the cement may cling firmly to the wire, it is best to twist two small wires together instead of using one large one.

If the twisted wire can be bought, cut to the right length and packed in bundles in the same way as bailing wire, it is best to procure it in this way. In case the twisted wire comes in rolls, it becomes necessary to straighten each piece before it can be used. In this case, it is best to purchase common smooth wire of the desired size and twist it on the farm. The twisting is easily done by tying one end of each wire to the opposite spoke of the fly wheel of some machine; a corn sheller or hand cider mill will serve the purpose very well. By tying the other end of the wires to a weight which may drag upon the ground, from 100 to 200 feet of wire may be twisted in a very few minutes.

* Experts in Farm Mechanics, Colorado Agricultura College, U.S.A.

In case a small engine is available the twisting becomes still easier. The advantage of the home twisted wire over twisted wire which is bought in rolls, lies in the fact that the former is straight at the end of the twisting process, while the later is bent and must be straightened.

The cutting of the wire is best accomplished as follows:—Set a cold chisel (with the edge up) in a low, rough bench, and at a distance exactly equal to the length of the reinforcement wire from the edge of the chisel, nail a block to the bench. Take a light hammer in the right hand and seize the twisted wire with the left. Then drag the wire over the chisel until the end of it strikes the block, when a light blow directly over the chisel easily cuts the wire. The piece which is cut off is now laid to one side and the end of the main wire is drawn to the block and another piece cut off.

SPECIAL REINFORCEMENT.

Some have suggested that a piece of wood be placed in the centre of the post as a reinforcement. This must be considered a failure, as the wood shrinks and expands by differences in moisture conditions. When it absorbs water, it is likely to swell and burst the post, and again when it dries it will shrink away from the cement.

Gas pipe has also been suggested as one of the best materials to use as a reinforcement. In case plenty of strong second-hand pipe is at hand, this may be true. As the pipe is placed in the centre of the post, it is not in position to act to the best advantage as a reinforcement, and for this reason it should be strong enough to withstand almost all the strain. New pipe would make the posts altogether too expensive.

Crimped wire is also claimed by some to be superior to that which has been twisted, but as the pull comes upon the wire there is a tendency to straighten the crimps. When the wires happen to be near the surface, there is great danger of the post being split by this straightening process.

Band iron and strap iron are also being used as reinforcement. In case the mixture has a good chance to get a grip on the iron, it will probably prove satisfactory, but unless the iron is roughened there is a danger of it slipping.

For very large posts, the twisted steel rods will prove as satisfactory as twisted wire. Smooth rods or smooth wire slip.

CURING THE POSTS.

In order for the cement to become thoroughly cured or "set," water must be supplied to aid in the action. This action goes on for a long time, some authorities estimating the total period at from 15 to 20 years. For the first thirty days the cement should be kept wet if the best results are to be expected. This means that the posts must be kept wet, and the question arises, what is the best system of keeping them in this condition?

The answer is a simple one. The most favourable conditions for conserving the moisture consists in curing the posts in a shed where the wind does not strike them. Under these conditions neither the sun's rays nor the wind have a chance to dry out the posts too rapidly. The only thing that now remains is to keep the posts in a wet condition.

After the posts are placed in an upright position in the curing shed, as described in "Handling the Posts," sprinkle them thoroughly every day. This may be done either by a hose and nozzle in connection with some form of pressure supply tank or by means of a garden sprinkler. In the latter case provision must be made so that the person doing the work may walk upon some structure above the tops of the posts.

The posts should be thoroughly sprinkled every day for at least thirty days.

HANDLING OF POSTS.

In removing the posts from the molds great care must be taken not to allow the posts to sag or crack. A post may be cracked in handling and still be fit for service, but it cannot be considered to be as valuable as an uncracked one.

There are two general methods of removing the posts from the molds.

The first method consists of laying the molds with the posts in them on a level bed of soft sand. The mold is then turned upside down and the post allowed to settle into the sand. The mold is next removed and the post allowed to lay undisturbed for several days. When the post is sufficiently strong it is placed in an upright position to be cured. While this method requires more space it is perhaps a little better for the posts than the second method.

The second method consists in removing the posts from the molds while in an upright position. The post is then allowed to lean against a wall or some other support. Thus only one handling is necessary. Care should be taken to have the bottom of the post close to the wall, as it is very likely to break if not kept very nearly in an upright position.

After the posts are cured and ready to set they should be moved from the curing shed and hauled to the fence line in a wagon having a strong, rigid bed. The bottom of the bed should be covered with a layer of straw to prevent breakage. Not more than three to four layers of posts should be placed in the wagon, depending upon road conditions. It must be remembered that a five-inch post weighs 100 pounds or more. When this is considered, we see how easy it is to load a wagon and also how sufficient weight may be placed on the posts in the lower layer to cause them to break.

In handling and setting care must be taken not to drop the posts. The weight of the post places unnecessary stress upon the different parts, and in case it is dropped there is great danger of it being cracked or destroyed.

A careless workman can easily do more damage to the posts than his services are worth.

WIRE FASTENERS.

In case of the wood post the method of fastening the wire consists of simply stapling the wire to it. In order to fasten a wire to a cement or concrete post a different system must be used.

With the ordinary wood staple in mind, one inventor has designed a small cast iron socket or staple holder which is placed where it is desired in the face of the post before the cement has hardened. When the post is set in the ground, the wire is fastened to it by simply driving an ordinary staple into the socket. The staples pull out much easier than they do from the wood post. The jar of driving in the staples tends to split and crush the post at the point where the cast staple holder is placed. Moreover, the cost of the staples and holders adds greatly to the expense of the post.

Another system consists of two staples which have the prongs bent to the side. The staples are placed about one-quarter inch apart, with the prongs projecting to the side. The line wire is placed between the two staples and a nail or piece of wire is driven down through the staples, outside of the line wire. As the tips of the staple touch the reinforcement wires, direct electric connections are established between the line wire and the ground at the bottom of the post. This, it is claimed by the patentee, insures the user against loss of stock by lightning. The system is called the "Double Staple."

A "single staple" may also be used, but the wire is fastened to the staple by a small "cold shut link," or wire ring. The latter system is not a very strong method of fastening, owing to the ease with which the cold shut links open.

Perhaps the most common method of fastening wires to cement or concrete posts consists of tying in the line wire to the post by means of a piece of smaller wire called a "tie wire" (usually No. 14 or No. 15 wire). The single tie consists of wrapping one end of the tie wire three or four times around the line wire, then passing the long end through a hole in the post and bringing it around to the face of the post where it is also wrapped around the line wire.

The tie around post is much the same as the single tie, except that the tie wire passes around the post instead of through the hole. Neither the single tie or the tie around post are very strong unless the tips of the tie wire are hooked over the body of the tie wire after the wraps have been made. This is known as the "special tie."

The strongest and perhaps the most satisfactory system of tying in the wire is the "Double tie." The tie wire is bent into the form of a long staple, straddled over the line wire and both ends passed through a hole in the post. One end is brought to either side and wrapped about

the line wire at the face of the post. This system insures a solid fastening and is equal in strength to any ordinary wood post fastening.

TAPER OF POSTS.

The holes in the posts are formed by No. 6 wires being placed in the post while it is soft. These wires are called "Tie Hole Pins." They are removed from the poured post after the cement has set for 24 hours. The pins are removed from the tamped posts immediately before the molds are removed.

To obtain the maximum strength with the least amount of material, the cement post must be so shaped as to have its greatest strength at the ground line.

While it is easy to make a post which tapers from the bottom to the top it requires somewhat more material than is necessary and it is smaller at the ground line than at the base. Thus the gradual taper not only uses more material than is necessary, but it reduces the strength at the place where it is most needed.

By making the post of uniform size from the base to the ground line, no material is wasted. The post may then be tapered from the ground line to the top.

Many of the posts which are being made now taper only one-half inch on each side from the base to the top. It has been found that in a 5-inch post which projects 4 feet above the ground, a taper of one inch on each side from the ground line to the top insures almost equal strength throughout. This design gives more strength with less material than those with the continuous taper.

STOCK INSPECTORS.—The following have been appointed Stock Inspectors for the Colony with effect in each case from the date specified:—W. H. Harber (from 15th November, 1909); Edward Boast (acting, for New Hanover Division, from 26th March, 1910); J. Radford (from 1st April, 1910); M. J. W. Ebersohn (assistant, for Nkandhla Division, from 4th April, 1910); C. J. King (assistant, for Ward 4 of the Lion's River Division, from 12th April, 1910); A. J. Swales (acting, for Inanda, Lower Tugela, and Mapumulo Divisions, from 13th April); G. H. H. Coventry (assistant, for Bergville Division, from 1st May); G. R. Murock, L. Havemann, and Tol Nel (from date of assuming duty).

The Bloemfontein Maize Conference.

REPORT OF THE PROCEEDINGS.

FULL TEXT OF RESOLUTIONS PASSED.

A REPORT of the proceedings of the Maize Conference held at Bloemfontein in January has just been issued by the O.R.C. Department of Agriculture; and as the telegraphic reports which appeared in the daily press at the time of the Conference were necessarily meagre, we publish below the text of the resolutions actually passed by the Conference as well as such portions of the discussions upon these resolutions as are likely to prove of interest to the general reader. The discussion that took place on the first of these resolutions on the production and harvesting of mealies for export, best varieties to grow, grading on the farm, etc., was particularly interesting, and in this case we reproduce it in full as we think there are many matters touched upon in it which will prove of interest to mealie-growers all over the country.

The Conference was held on the 18th and 19th January; and the various Colonies were represented by the following delegates:—

Railway Representatives.—Sir Thomas Price, General Manager, C.S.A.R.; Messrs. A. J. Robb, Assistant General Manager, C.G.R.; W. Binns, C.G.R.; J. McConnachie, District Traffic Superintendent, N.G.R.; John Rinnie, Durban Harbour Captain; W. J. K. Skillicorn, N.G.R., General Manager's Office; S. Seruya, C.F.L.M.; D. Watson, C.S.A.R., and G. S. Oettle, C.S.A.R.

Chambers of Commerce.—Messrs. A. Keeling, Johannesburg; A. Lewis, East London; M. W. Hayne, Durban; K. Spilhaus, Capetown; Geo. Hobson, Basutoland; W. Ehrlich, Bloemfontein; C. F. Kayser, Port Elizabeth; H. Ruffel, O.R.C. Chamber of Commerce.

Shipping Interests.—L. MacLean, Union-Castle Line; Otto Siedle, Natal Direct Line, Durban; A. H. Rennie, Natal; W. Macfarlane, Union-Castle Line, Durban.

Departments of Agriculture.—W. J. Palmer, Director of Agriculture, Bloemfontein; M. J. Joubert, Bloemfontein; B. Enslin, Pretoria; B. Stillington-Anderson, Co-operative Expert, Transvaal; J. Burt-Davy, Government Botanist, Transvaal; R. W. Thornton, Capetown.

Producers.—Messrs. H. A. Light, Natal; J. Moon, Natal; H. Stanley, Wrenner; Wm. A. McLaren, Vereeniging; J. B. de la Harpe, Blackwood, Fouriesburg; J. Pierce, Heilbron.

Official Graders.—T. A. Westbrook, Durban; P. Rose-Innes, Capetown; H. Kest, Laurens Marquies.

Upon the motion of the Director of Agriculture, O.R.C., it was agreed that Sir Thomas Price should take the chair.

The Conference was opened by the Minister of Agriculture for the Orange River Colony, General De Wet, who delivered an interesting address. After welcoming the delegates, General De Wet said that the question of export, not only of maize, but of any kind of grain they might eventually export, was of the utmost importance to South Africa. They all knew many difficulties stood in the way of export of maize, and the greater obstacles were experienced at the Coast when maize arrived from up-country in a wet condition. Many difficulties arose with regard to the speedy shipment at the Coast and the shipping freight to Europe. There were representatives at the Conference from all Colonies, and they would be able to give the Government a lead and suggest how to arrive at the most satisfactory arrangement with regard to shipping freights. He spoke on behalf of the Governments of South Africa when he said that there was a desire to have their maize exported by no other lines than by the English ones. (Hear, hear.) But if his best friend would not meet him he would be obliged to go to the next best one. He hoped that the day was near when they could arrive at some arrangement with the shipping companies which would be satisfactory for the whole future. Another burning point was the exportation of wet maize. He would remind them in this respect that, just as there were irresponsible farmers, so there were also irresponsible merchants, and especially the smaller traders and speculators in the country districts who went around to buy up maize. The regulations with regard to export should be so stringent that if a man had once sent wet maize to the Coast he would never do so again. He was not afraid that strict regulations would harm the export trade. His idea was that they must not only

CONFISCATE WET MAIZE.

but also impose fines on the senders.

Proceeding, General De Wet said he was glad that the new methods employed in other countries were beginning to take root in this country and were going ahead rapidly. The experiments taking place close to Bloemfontein, in one of the driest districts, showed that South Africa could produce an enormous quantity of maize. He thought the Conference had not been called together one moment too early in order to make the best arrangements for the exportation of maize. He wished them all success in the important work before them. The various Governments would, as far as was in their power, give the resolutions of the Conference their earnest consideration. (Loud applause.)

The Chairman (Sir Thomas Price) followed with a few remarks; and the Conference then proceeded to business.

The first matter to be discussed was the question of the

PRODUCTION AND HARVESTING OF MAIZE FOR EXPORT,

best varieties to grow, grading on the farm, etc.

Mr. M. Joubert (Bloemfontein), introducing the subject, said that the most important point for the producers was the sowing of pure seed. The Agricultural Departments should be the centres from which pure seeds were distributed. Sometimes it happened that the farmers did not always get value for their money from the merchants. Cultivation was another important question in the production of maize, and early ploughing was essential. Farmers did not always discriminate between the different sorts of maize, and up till now many merchants had not done so. The sooner the merchants and the farmers came to some understanding the better it would be for both of them.

Mr. J. Moon (Natal) could not agree with Mr. Joubert. The graders had never complained about the quality of the maize itself. The chief point to be discussed was the production of maize, and it rested entirely with the farmer what kind of mealies he grew. The farmer had to find out for himself which variety was best suited for his district. He must be educated to produce a good, clean, separate kind of maize and not to grow mixed colours.

The Chairman pointed out that first of all they had to arrive at a resolution about the best kind of grain. It was their purpose to induce the production of such grains which would command the best prices, and which at the same time combined those characteristics which were most required in the market they had to supply.

Mr. J. B. de la Harpe (Fouriesburg) said that the earlier farmers could plough the better it would be, but as a rule they had no early rains. They would not get the farmers to grade the varieties on the farm before railing, but they would induce them to grow separate kinds. There was so many different conditions and circumstances of climate and soil that it was impossible to lay down a hard and fast rule. It was far better to leave it to the farmer to select the variety which was most suitable to his particular conditions.

Mr. B. Enslin (Pretoria) said they could not go into details with regard to production and the selection of varieties of maize, because the climates were too different in the various Colonies. The farmer must endeavour to supply those varieties most wanted by the European market, but they should grow as few varieties as possible. The Agricultural Departments should send round men to educate the farmers and show them which varieties were most in demand, and assist them in selecting the particular kind which was likely to give the best yield under the particular circumstances.

Mr. A. Lewis (East London) said that the merchants were quite cap-

able of supplying the farmers with the seed they required, and he opposed the idea that the Agricultural Departments should distribute seeds.

Mr. H. Stanley (Wepener) thought that this Conference should recommend farmers to sow maize by drill and not by hand.

Mr. J. Pierce (Heilbron) agreed that the farmers should be encouraged to sow with drills and improve their methods of cultivation. With regard to varieties, he thought that the Hickory King was one of the most productive in the northern districts, but it had to be put in early. The white and yellow Cargo were also very good yielders. It was not desirable, however, to specialise, and what was suitable for one part of South Africa did not suit another. His experience was that any good and sound maize would find a ready market.

Mr. K. Spilhaus (Capetown) said that white flat maize had commanded, as a rule, the best price in the European markets, but on the other hand, yellow round maize was worth more on the Australian market than white flat. Therefore the market prices often fluctuated, and the demand for the various qualities was continually changing, according to the country buying. Mr. Spilhaus further stated that Basuto mixed fetched a higher price in the European market at the commencement of the season than round yellows.

Mr. J. Burt-Davy (Pretoria) held that the farmer should grow the variety which gave the heaviest yield in his district. From the farmers' point of view it was the best to stick to one colour. The Transvaal Agricultural Department was constantly bringing in new blood; its object was to get earlier maturing varieties and good yielders. The Transvaal Government had recently imported twenty-five new varieties and they were now experimenting with these. The longer a variety was grown in a certain district the better it acclimatised and the better the results obtained.

Mr. W. J. Palmer (Director of Agriculture, Bloemfontein) pointed out that in the past the farmers had produced for local consumption and all they had to do was to grow good, sound maize. Now, however, they had to cater for the European market, and had to look to the taste of the oversea consumer. Henceforth they had to cater for a critical set of buyers and so compete with the American producers. The great difficulty was to get pure seed. He thought it the duty of Agricultural Departments to assist the farmer in this direction. There should also be a system of grading on every farm. The time would come when the best only could go oversea. He did not suppose that they could come to any resolution on this matter, but he only put it on the agenda to have an interchange of opinion on the subject.

Mr. W. A. McLaren (Vereeniging) dwelt on his experiences as a maize grower. As far as ploughing was concerned, it could not be done



PEAR TREE AT WEENEN EXPERIMENT STATION.

(Photo taken in March, 1910).

too early. At the present time for instance there was no special work to be done by the oxen and they could be employed to break up the land. A farmer should grow maize on the land one year, then plough it up and fallow it for one season before putting in another crop of maize. Every farmer should find out as soon as possible what variety could be best produced on his farm. It was not for this Conference to decide upon this question. The farmer would soon find out which variety paid him best, and it could be left to him to make a selection as long as the variety was sound and pure. They further had to try to make the cost of production as low as possible.

Mr. J. Moon (Natal) said the maize growers in Natal could not give effect to the methods advocated by Mr. McLaren. It would be all right in the case of very large farms to leave the lands idle for two years, but this was impracticable in Natal.

Mr. J. Burt-Davy (Pretoria) maintained that the method advocated by Mr. McLaren was the best. Land should not be continuously used for maize production. It was not necessary to leave the field idle in the meantime; other crops could be grown on it. Referring to the Hickory King variety, he said its area of profitable cultivation was strictly limited on the extreme high veld. Though Hickory King was much in demand, it was not suitable for all requirements of the trade. He recently sent samples of the best Hickory King to a big manufacturing firm in England and asked for a report. The reply was that the sample did not meet the requirements of that particular trade, because the proportion of starch was too small.

Mr. R. W. Thornton (Capetown) said that one of the most important points was that farmers should increase the production of maize per acre, and so cheapen the cost of production. With regard to the wholesale importation of seed, he did not think the Government should undertake this work and so come into competition with the seedsmen, whose legitimate work it was. The Government should continue to distribute samples of different varieties. The farmers, through their societies, could get the merchants to submit samples of seed, which could be tested by the department, and the merchants could then sell in bulk to the farmers according to the sample submitted. Later on farmers would be in a position to breed pure seed themselves.

Mr. A. Keeling (Johannesburg) held that the Agricultural Departments should go on with their experiments, and supply small quantities of pure seed to applicants. The Government, however, should not enter into competition with farmers, many of whom made it their special business to sell pure seed. It was advisable for every farmer to restrict himself to one particular variety. If more varieties were grown all would agree that strict separation was necessary.

The Chairman remarked that they had to grow maize for sale, and so far they had not had much information about the character of the maize that was most in demand. Would Mr. Keeling give his opinion as to the most marketable variety?

Mr. A. Keeling, in reply, said that, taken all round, the white flat and yellow round had commanded best prices.

Mr. G. Hobson (Maseru) recommended early ploughing. The farmers should plant as early as they could, and use drills in preference to sowing by hand. On many farms they could already see the beautiful, straight rows of maize plants. If a farmer had once found out which was the variety of maize most suitable to his soil and climate he should stick to it. In this respect the Agricultural Department would always give him advice, but he had to go to a certain extent by his own experience. He was a farmer himself, and considered that it was one of the easiest things to do the grading on the farm. Basuto mixed maize often fetched as much on the London market as the best varieties.

Mr. W. J. Palmer (Bloemfontein) moved:—

"This Conference recommends to the favourable consideration of the South African Governments the advisability of issuing a joint notification, to be renewed periodically to farmers throughout South Africa, giving: 1 (*a*) The descriptions of maize which experience has shown to be calculated to give the best yields in the several districts; (*b*) the best methods to be employed in preparing the land for sowing and the best methods of harvesting; (*c*) the descriptions of maize most in demand; (*d*) the disadvantages of mixing maize either as regards colour or quality in the same bag; (*e*) particulars as to the supply of pure seed and where procurable; (*f*) any other information calculated to be of service to growers and buyers. 2. That the different Departments of Agriculture issue small samples of pure seed to interested producers for experimental sowing, but that such distribution be limited to experiments only, so that commercial interests will not be interfered with."

Mr. J. Pierce (Heilbron) seconded.

Mr. S. Seruya (C.F.L.M.) said the great difficulty the Mozambique Agricultural Department had to contend with was that the growing of maize was to a great extent in the hands of natives. Any resolution, however, this Conference would make would have the careful consideration of his Government and would be carried out as far as possible.

The Chairman said he thought the resolution moved by Mr. Palmer crystallized the current of the discussion. The subject was fully discussed and he would put the resolution to the vote. The resolution was carried unanimously.

Mr. K. Spilhaus (Capetown), in further explanation, stated that he had not advocated the growing of mixed maize. He had only referred

to Basuto mixed maize to show the extent to which prices fluctuated.

The following are the other resolutions moved and finally adopted by the Conference:—

GRADING.

(1) APPOINTMENT OF GRADERS.

“This Conference recommends that in order to secure uniformity of practice and standards, immediate measures be taken to place the grading of maize under one authority, and that for giving effect to this object a Chief Government Grader be appointed, with assistants, solely in Government employ, at the ports and inland centres.” (Moved by Mr. N. Lewis, East London.)

(2) GRADING STANDARDS.

Mr. Ehrlich (Bloemfontein) moved:—

“This Conference recommends that a committee be appointed annually to meet at a time to be notified by the Union Minister of Agriculture for the purpose of deciding the standard grades for each year, such committee to consist of one representative from each Province to be nominated by the Associated Chambers of Commerce, one member of the Agricultural Department of each Province to be nominated by the respective Governments, and one member representing each Province to be nominated by the South African Agricultural Union.”

The Conference was further of opinion that the committee recommended in terms of the above resolution should be appointed in the first instance as early as possible, so as to enable the required regulations and certificates to be issued in good time for application at the outset of the approaching maize shipping season. The Conference also suggested that such committee be empowered to consult the representatives of the shipping, mercantile, agricultural, railway, and port interests, as it may deem necessary.

With a view to giving effect to the foregoing suggestion, the Chairman was authorised to communicate with the respective Governments on behalf of the Conference urging them to arrange—in anticipation of Union—the appointment of the committee.

Mr. H. A. Light (Natal) moved:—

“This Conference recommends that the committee referred to in Resolution 3 [previous resolution.—Ed.] also deals with: (a) Reduction or otherwise of present standards; (b) The advisability of one standard being selected for each grade; (c) The percentage of sound grain necessary; (d) The annual distribution of standard samples in South Africa, Great Britain, Europe, and other purchasing countries; (e) That it be an instruction to the said committee that it should ascertain from the European markets the grades most acceptable and decide accordingly.”

GRADING AT PORTS.

Upon the motion of Mr. K. Spilhaus (Capetown) it was agreed that:—

“This Conference recommends that it be an instruction to the Official Grader that every bag must be examined at the port of shipment before granting a certificate.”

STANDARD OFFICIAL DOCUMENTS.

The Chairman moved:—

“This Conference recommends that a form of certificate, applicable to all ports, in connection with the export of maize, shall be prepared by the committee referred to in Resolution No. 3 in consultation with the Chief Grader. Any certificate to be issued must bear no alterations or erasures. The committee should further consider the advisability that all certificates be filled in with ink or typewritten.”

This was agreed to.

BAGS.

It was agreed that the Chairman should obtain information relative to the correct methods of sewing up bags, and that he have diagrams prepared for the information of producers.

Mr. A. Keeling (Johannesburg) moved:—

“This Conference is of opinion that old or second-hand bags shall not be used for export purposes, and also urges that at least $2\frac{1}{2}$ -lb. reputed weight shall be insisted upon for the present, but that actual $2\frac{1}{2}$ -lb. bags of A quality twill, or heavier bags if necessary, be used at the earliest possible date; such bags to be of a given measurement to carry 200 lb. of maize.”

This was seconded by Mr. M. J. Joubert (Bloemfontein) and agreed to.

Upon the motion of Mr. B. Enslin (Pretoria) it was agreed that:—

“This Conference recommends that the contents of bags of maize be limited to 200 lb.”

MARKS AND CERTIFICATES.

The committee appointed to report upon the question of marks and certificates recommended the adoption of the following suggestions:—

(a) That the various grades and sub-divisions thereof be indicated by running numbers from 1 to 15, such numbers to be stencilled in red and placed in a circle on the upper side of the mouth of the bag.

(b) That the leading mark and the port mark be one, and that the shipping companies be requested to submit to the committee appointed as per Resolution 3 the lettering they desire adopted for the different ports of discharge.

(c) That a uniform system of stencilling or stamping be adopted for marking purposes, such to be decided by the Chief Grading Officer.

(d) That the following colours be adopted by the several ports of shipment for indicating the port marks:—

Delagoa Bay	Black.
Capetown	Blue.
Port Elizabeth	Red.
East London	Green.
Durban	Yellow.

(e) That it be optional for full truck loads of one grade, from one consignor to one consignee, to be sent without sender's marks.

(f) That all particulars stated on the grader's certificate, also appearing on the bill of lading, shall be identical on both documents, which must also bear the same date.

(g) That the railway and harbour authorities shall provide the proper facilities for correct weighing at the ports and shall issue weight certificates to the shippers when requested, and that it be an instruction to the port authorities not to issue such certificates unless the trucks have been retared.

(h) That it be a recommendation to the committee referred to in Resolution 3 to frame uniform certificates to be issued for grain passed or reected by the Government graders at the several ports.

These recommendations were finally adopted by the Conference.

SHIPMENT OF UNFIT MAIZE.

Mr. W. J. Palmer (Bloemfontein) moved, and it was agreed without discussion that—

“In the opinion of this Conference it is not advisable that reduced rates for maize apply to certain months of the year only.”

The following resolution, moved by Mr. K. Spilhaus (Capetown), was also adopted:—

“That maize railed apparently in sound condition, which was found to be slightly weevily on arrival at the port, be allowed to be shipped at export rate, providing the shipping companies were willing to accept same.”

MINIMUM CONSIGNMENTS.

Upon the motion of Mr. J. Moon (Natal) it was agreed that—

“This Conference recommends that the present arrangement as to the 100-bag minimum consignment should continue.”

RATES AND FREIGHTS.

The following three resolutions were carried:—

(1) “This Conference recommends that the export rate of 10s. per ton of maize shall apply to all South African centres represented at this Conference where the export rate does not amount to less than 10s.”

(2) “This Conference urges the necessity of similarity of practice

being introduced at all South African ports, together with the services performed at each in regard to the export of maize oversea."

(3) "This Conference, having heard the views of the representatives of the steamship companies, desires to urge upon the several Governments and upon the Union Government the seriously prejudicial effect any increase of shipping freight will have on the production and export of grain; this Conference therefore resolves to urge upon the Governments to take such measures as may be necessary to ensure, if possible: (a) Maintenance of the present freight; (b) Sufficient ship tonnage to carry the maize traffic; (c) Opportunities to ship directly to other leading ports in the United Kingdom and the Continent, in addition to the present ports of landing; and (d) A contract for at least three years to fix these conditions."

STATISTICAL BUREAU.

The following resolution, proposed by Mr. A. Keeling (Johannesburg), was carried without discussion:—

"This Conference recommends that a properly constituted statistical bureau be at once inaugurated and an expert appointed. This bureau to provide statistics of acreage planted, report monthly on seasons and probable yield of crops, and show extent of South African consumption, estimates of final yield and of exportable surplus, the estimates to cover also native crops and monthly statistics of quantity exported, etc."

STORAGE OF MAIZE.

Mr. J. B. de la Harpe (Fouriesburg) moved:—

"This Conference is of opinion that maize for export should be stored up-country as long as possible, and that for this purpose the Government should be requested to erect covered storehouses but open at the sides at the chief grain-exporting railway stations for the convenience of farmers and merchants, and that a charge be made for storing and holding grain to cover the cost. Regulations to be made so that grain cannot be held in such stores for speculative purposes."

Mr. W. J. Palmer (Bloemfontein) seconded, and the motion was adopted.

GRAIN ELEVATORS.

The following resolution was carried:—

"This Conference having heard the views of the representatives of the steamship companies regarding the erection of elevators recommends that, before any decision be taken, exhaustive inquiries, preferably by the appointment of competent persons visiting Argentine, the United States, Canada, and Russia, be made by the Government."

CHECKING OF BAGS BY RAILWAY.

Mr. K. Spilhaus (Capetown) moved:—

"This Conference is of opinion that it is desirable that arrangements be made by the railway authorities to check (if requested by sender) the number of bags loaded, even if extra expense has to be incurred by the individual desiring such service. The department in such instances to accept responsibility for numerical shortages."

The resolution was carried.

COMMITTEE FOR GRADING STANDARDS.

Mr. B. Enslin (Pretoria) moved:—

"That this Conference is of opinion that the committee recommended in Resolution No. 3 be appointed as early as possible, so as to enable the required regulations and certificates to be issued in good time for application at the outset of the approaching maize shipping season.

"The Conference also suggests that such committee be empowered to consult the representatives of the shipping, mercantile, agricultural, railway, and port interests, as it may deem necessary.

"With a view to giving effect to the foregoing suggestion the Chairman is authorised to communicate with the respective Governments on behalf of this Conference, urging them to arrange—in anticipation of Union—the appointment of a committee."

After some discussion the motion was carried, and the matter left in the hands of Sir Thomas Price.

MAKING MEAD.—Mead or honey wine is a most charming drink, and at the same time, most wholesome. Mixed with soda or other mineral water, it makes a nice refreshing summer beverage. Rather than spoil a trade obtained by selling first-grade honey, use inferior quality in the making of mead. Here is a recipe that will produce a sample equal to others that have taken a gold medal and other special prizes. Put in six gallons of water twenty-four pounds of honey. Boil half-an-hour, removing the scum as it rises. Add three ounces of hops, boil again for fifteen minutes, strain into a cooling vessel, and when luke-warm stir in six tablespoonfuls of brewer's yeast. Let it work twenty-four hours, then remove the head and put into a five-gallon cask into which has been put a bottle of brandy and two lemons sliced. Leave out the bung and allow it to work over, filling up with spare liquor. Bung down when working ceases, and bottle in two years. For larger or smaller quantities use the proportions as follows:—1 gallon water, 4 lbs. honey, $\frac{1}{2}$ oz. hops, 1 tablespoonful yeast.—*Journal of the Jamaica Agricultural Society.*

Shield Budding the Mango.

By J. E. HIGGINS,

*Horticulturist, Hawaii Agricultural Experiment Station.**

THE possibilities of the mango as a tropical fruit for the world's markets are gradually being appreciated. Since it has been demonstrated that the fruit can be successfully shipped long distances in refrigeration, and since the fine varieties have become more widely known, a new interest is being awakened in the fruit. Already the Agricultural Departments of several tropical countries are devoting attention to the development of the mango as a fruit industry and commercial orchards are being planted. It is confidently expected that the next decade will be marked by a large increase in plantings.

One of the most pressing problems that presents itself for solution at the beginning of this development is to find an expeditious method of propagation, seeds being no more reliable in the production of excellent varieties than in the case of most other tree fruits. Very considerable progress has been made in the working-out of this problem. In very early years, before the commercial side was seriously considered, the first step was taken in India by the application of inarching to the mango. This consists essentially in grafting scion to stock while each continues to be supported by its own root system. It is cumbersome and, except for special purposes, is too slow for commercial use. A great step in advance was made by Oliver(*a*) and by Knight(*b*) in adapting patch-budding to the mango. By this means it became possible to plant seedling trees in orchard form and later bud them to desired varieties. The method, however, requires considerable dexterity and can be successfully applied only when both bud-wood(*c*) and stock(*d*) are in flush, a condition which frequently does not exist in both members at the same time. It is the hope of adding some small increment to the knowledge of mango propagation that the following results are offered.

DESCRIPTION OF METHOD.

The proposed method is new only in its modifications and in its application to the mango. It is merely shield budding with an inverted "T," adapted to the peculiarities of the mango. Shield budding is probably one of the oldest, and certainly the most widely practised, of all methods of budding. Ordinary shield budding had been tried on the mango long ago, following the general practice in the selection of bud-

* This article appeared originally as Bulletin No. 20, of the Hawaii Agricultural Experiment Station.—Ed.



SHIELD BUDDING THE MANGO.

Showing how the process of Shield Budding is adapted to the Mango Tree.

(See Article).



SHIELD BUDDING THE MANGO.—II.

Mango Shield bud from which one Wing of Bark has been removed.

(See Article).

wood and stock that govern in the shield budding of citrus fruits, peach, or plum. In this case young bud-wood was used with the leaf still attached, and it was inserted in young wood. It soon became apparent, however, that this method would not work successfully, and it was abandoned, giving place to the patch bud, spoken of above, which was practised with more mature bud-wood and stock. The present method consists in using wood of the same maturity as in patch budding, but adopts the similar device for bringing the bud shield into contact with the stock, known as "shield budding" with an inverted "T" incision.

MATERIALS AND TOOLS NECESSARY.

The materials and tools which will be found most convenient in performing this work are the following:—(1) Budding-knife with bone handle to raise the bark; (2) raffia; (3) grafting wax; and (4) waxed cotton bandage. The budding-knife will be necessary to make the incisions, and the bone handle to raise the bark. The raffia has a special advantage as a tying material in that it holds firmly for the few weeks necessary, and without cutting the bark. It will also decay or be broken by the expansion of the stock under the waxed bandage. It can be obtained from dealers in gardeners' supplies. If only a few buds are to be applied, other soft but strong tying material may be used. The wax may be prepared according to the following formula: Beeswax 2 parts, resin 4 parts, beef tallow 1 part, by weight; break these into small pieces, place them in any pot or tin container and melt them over a slow fire. When they have become thoroughly liquified, remove from the fire and pour into a bucket of cold water. When sufficiently cool to be handled, apply tallow to the hands and pull the wax like candy until it has acquired a good grain and light colour. The bandage may be made by dipping strips of cotton in bees-wax liquified over a slow fire. These strips of cotton are usually made as wide as can conveniently be placed in the vessel containing the wax. When removed and cooled, the cotton may be rolled and cut off in pieces of any desired width. Strips about three-quarters of an inch to one inch wide are found convenient for this work.

THE STOCK.

Budding by this method has been successfully performed on stocks from an inch to three inches in diameter. What the limitations are, on either side of these dimensions, is not known at present. Wood of this size, in seedling trees, may be from two to five years old. It is essential that the stocks be in a thrifty condition, and, still more important, that they should be in "flush." If not in this condition, the bark will not readily separate from the stock. It has been found that the best time is when the terminal buds are just opening. Unless the trees are watched carefully they will pass this stage before the flush is observed. When the

THE BUD-WOOD.

The bud-wood which has been most successfully used is that which has lost most of its leaves and is turning brown or gray in colour. Such wood is usually about an inch in diameter. It is not necessary in this method of budding that the bud-wood shall be in a flushing condition, although it may be an advantage to have it so. It should, however, be healthy wood of normal growth.

THE INCISIONS.

The incisions should be made in the stock about six inches in length. At the lower end of this make an incision at right-angles to it, with the knife edge pointing upwards at an angle of about forty-five degrees with the stock, thus making a curved incision. Insert the sharpened end of the handle of the budding-knife beneath the bark at the junction of these incisions, and push it gently upward, raising the bark so as to make a place for the bud. It is not necessary to push the handle far, but, by gently prying, the bark may be separated from the stock, if the latter is in proper condition, without injuring the delicate cells against which the bud shield is to be placed.

THE BUD.

The bud is now to be removed from the bud-wood. With a rather heavier knife than is generally used for budding, in the right hand, and the bud-wood held firmly in the left, place the blade against the bud-wood with a very slight inclination, and cut so as to make as flat a surface as possible under the bud shield. This bud shield should be about 3 to 3½ inches long, with the bud in the centre. The small portion of wood, which will thus be taken off with the bud shield, may be removed if it slips readily. If not, it should be left in place. The lower end of the shield is then taken between the thumb and finger and gently inserted in the incision prepared for it, pushing it up until it is held firmly in place by the surrounding bark.

TYING AND WRAPPING.

The stock must then be tied with raffia or some other soft, but strong, tying material, so as to prevent drying out. The cut surfaces below the actual bud are usually covered with grafting wax, and the whole is then wrapped with a waxed cotton bandage, beginning at the lower part and winding spirally to the top, exposing only the actual bud. This method of wrapping protects the bud and the wound from the access of water. The bud is shaded by a short piece of bandage hung over it and held in place by being laid under the upper strands of the spirally wound bandage.

AFTER-TREATMENT.

In about three or four weeks, if the bud remains green, the stock should be lopped at a point about seven inches above the bud. Care

should be taken in thus cutting the stock partly off to avoid splitting downward. It should be made to split upward into that portion of the stock which is to be destroyed. This looping will serve to force the bud into growth. Many of the buds, on the sides of the stock, will start into growth before the new bud. These must all be cut off. It has not been found necessary to remove the tying and wrapping material until the bud has made two flushes, and often it is not necessary at all, since the raffia usually decays beneath the waxed cloth, and the latter naturally expands with the growth of the stock. When the bud has started into growth the top of the tree may be completely cut off and destroyed. The stump remaining above the bud may be cut off with a sloping cut close to the bud, after the latter has made three or four flushes.

ADVANTAGES OF THE METHOD.

SPEED.

It has been found that buds can be set quite rapidly by this method. In the experience of the writer, five or six buds could be set by this means to one by the patch bud method. Speed may be increased also by the use of unskilled labour in the tying and binding operations. The operator can set the bud and pass on to the next without any danger of it getting out of place before the helper, who immediately follows, ties it.

Perhaps the most important advantage in this method of budding lies in the fact that it may be used successful when the bud-wood is not in an active growing condition. The most tedious part of patch budding is in removing the bud, and frequently in doing so it will be broken. Further, it is frequently impossible to get bud-wood of a desired variety in active condition when the stocks are ready to be operated upon.

ADAPTABILITY.

The method may be applied most advantageously to seedling trees in orchard form when they have become large enough to be operated upon, when the buds should be set only a few inches above the ground. It may also be used in top-working old trees to new varieties. For this purpose, the main branches of the trees must be cut down to a point about two feet from the trunk. The cut surface of the wound should be painted with ordinary lead and oil paint to prevent drying out and checking. The remaining stumps will send out numerous young shoots, and from these a few may be selected for budding. The others should be broken off before they have made growth so as to throw the vigour of the tree into the selected shoots. When these new branches have arrived at the condition described above, buds may be inserted in them to form the new head for the tree. It is better not to cut off all the large branches the same year.

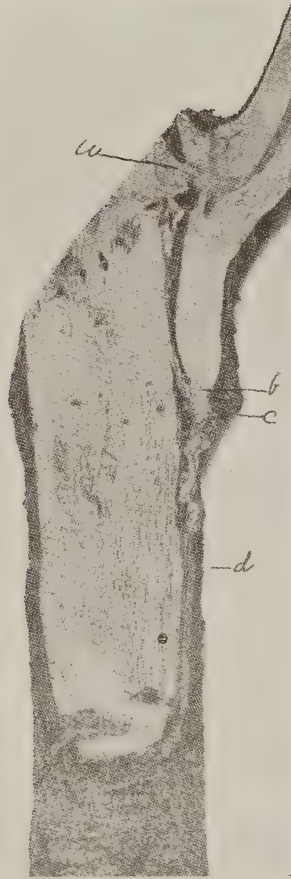
It is too early to report the results of this method as applied to nursery trees, but from the experience at this Station it seems highly probable that the method would be applicable in the nursery also. Seedling nursery trees, of several years' growth, have been successfully transplanted by severe cutting back. In all probability, nursery trees budded as early in the growth as possible, and near to the ground, could be successfully removed a year or two after budding. Nevertheless, it is recommended as better practice to plant out young pot-grown seedlings, budding them as soon as they have become of sufficient size.

STUDY OF THE BUD UNION.

THE REGION OF UNION.

It may be unnecessary to point out the region of union between the bud and the stock, but from the widespread misconception of this subject, it is believed to be necessary to draw attention to some facts in this connection. For example, in budding with a patch of bark inserted into an opening of the same size in the bark of the stock, it is quite commonly misconceived that the union takes place along the edges of the bud patch, uniting the latter with the bark of the stock. This, however, is not the case. Union is effected in a more or less broken ellipse, corresponding to the line between the bark and the small portion of wood adhering to the bud shield. A moment's reflection should serve to show that this is the only region where it is possible for a union to be effected. The cells of the wood are too old and inactive to take any part in a coalition with any plant substance with which it could be placed in contact. Likewise, the cells of the bark are too old to unite with other plant substance. It will be recalled that the region of growth lies just between the bark and the wood, and that this thin layer of cells is known as the cambium. The cells in this part are thin-walled, tender, and in process of subdivision. When this cambium layer, lying between the bark and the small piece of wood, is placed in contact with the cambium of the stock, and is held there for a considerable period, the new cells forming by the subdivision of the cells placed in contact constitute a continuous layer through stock and bud. The small portion of wood, held within the bud shield, dies and becomes dried up.

When the incisions are made in the stock to prepare a place for the insertion of the bud shield the bark of the stock separates from the wood along the line of the cambium zone. When this bark is again pressed down upon the bud shield at its edges and into place against its own cambium, union again takes place more or less completely along the zone where it has been separated. The bud shield, however, will prevent the wings of the bark of the stock from returning perfectly into position. A region will, therefore, be left surrounding the bud shield where no



SHIELD BUDDING THE MANGO.—III.

Section through a Mango Bud Union after several flushes have been made.

(See Article).

union can be effected between two layers which were in contact before the budding operation was begun. This leaves a zone in the form of an ellipse surrounding the bud shield and on which all the surface cells have become dry.

Since, however, the bud shield which is united with the stock is in vital contact with it and is drawing its sustenance from this source, there must be a continuous layer of active cells beneath those that have become dried; otherwise there would be no possible means of communication between the bud branch and the stock.

MODIFICATION OF CELLS DUE TO THE BUD.

If a mango branch be examined it will be observed that numerous buds are to be found—one in the axil of each leaf, and one above each scar where the leaf has been dropped. Nearly all of these buds remain dormant. If the branch is split through the centre, it will be found that the bud, as in the case of most dicotyledons, is connected with the centre of the branch by a thin line of pith. Nearly all the elongation of cells takes place in the direction of the growth of the main branch, but a few bundles are elongated toward the dormant bud. If this branch is cut off just above one of these buds, the latter will be forced into growth. The flow of sap toward the newly developing bud will cause the elongation of the cells toward the new bud. In other words, the grain of the wood will be changed in direction.

If a new bud from some other tree be inserted under the bark of this branch, and if union takes place, a corresponding change in the direction of the grain will take place. There will be this difference, however, that there will be no central pith connecting the new bud with the centre of the main branch. When union is first effected, as pointed out above, it is in a more or less broken ellipse along the line of the cambium zone, lying between the bark of the bud shield and the small portion of wood beneath it. At this point of union it may often be seen that the elongation of cells takes place in a direction at right angles to the natural grain of the wood of the main branch. As growth continues the newly forming cells become less and less sharply angled at, or near, the point of union, and gradually assume the direction of the new branch. If a budded branch of a few months' growth be cut through longitudinally, the old line showing where the bud was applied may readily be seen, covered by new layers of wood. These layers are continuous between the new branch and the stock. It will be understood that they are also continuous in the circumference of the stock and branch. Each year, as new layers are added, the line between the bud and the stock becomes the more deeply embedded in the tree. In this way the new growth completely surrounds the old, and the new tree top becomes as firmly attached to the stock as one of its own branches would have been. A careful study

of these mango bud-unions leads to the belief that no fear need be entertained as to their strength.

A similar change in the direction of the grain frequently takes place under the wings of bark which have been replaced after the insertion of the bud.

AN ADAPTATION OF INARCHING.

In relation to the matter of propagation it may be well to mention here an adaptation of inarching which has been found very useful. It has been stated above that inarching is a cumbersome and tedious process for the multiplication of a variety. Nevertheless, there are cases in which it can be made to serve a valuable purpose. Frequently this station has received inarched potted plants. It has been found that these often fail to do well when planted out. Sometimes the root-system has been too long confined to the pot, or long transportation has reduced the vitality of the tree. Such trees are no longer planted in the station orchards on their own roots, but are grafted by inarching to the side of a strong seedling already in the orchard row. For this purpose the pot is sunk in the soil close to the seedling and only a small portion of the potted tree need be grafted to the new trunk. After the union has been effected the pot plant may be taken to another tree if desired, and the process repeated. By this simple adaptation a shoot only a few inches in length has been made to produce a tree top of 5 feet spread and $4\frac{1}{2}$ feet height in less than a year.

Dairy farming will not maintain soil fertility for ever when nothing is fed but that produced on the farm.

The danger of wasting soil fertility lies in the fact it takes place so slowly no account is taken of it until too late.

The pig is raised only for its meat, and this being the case, the object is best subserved by turning it into meat as soon as possible.

Disease germs are present on nearly every farm. The best way to fight them is to keep the stock in a healthy condition.

The brood sow must not be fed heating food the first three days after farrowing. To do this is to invite caked udders or milk fever, and kill the pigs.

Caponising.

HOW THE OPERATION IS PERFORMED.

WE have received from a reader of the *Journal* a request to be supplied with some practical details of the art of caponing or caponising—*i.e.*, the operation necessary to convert cockerels into capons with a view to increasing their growth—and as some description of the operation will doubtless be found of value by many of our readers, we publish herewith the best information on the subject, in a condensed form, which has come to our notice. The article which we have drawn upon for the details that follow was published in the December, 1909, number of the *Illustrated Poultry Record*. An illustration is published in conjunction with the article, showing the instruments, etc., required by the operators, and as the illustration itself is not sufficiently clear for reproduction in these pages we may describe the appliances it depicts. First, two half-bricks are required, with cords attached, for holding down the bird; then there is a short-bladed pocket-knife, a pair of wire spreaders for opening the wound during the operation (a piece of wire several inches long is taken and bent in the centre to a *complete* circle—a circle and a half, really—the ends of the arms being left at a short distance apart and the tips of them bent inwards: the circle itself acts as a spring to keep the arms apart), sponges made of cotton wool twisted around the ends of matches, forceps for taking hold of the testicles (these are made in much the same way as the spreaders), and a surgical needle and silk for stitching wounds. Besides these appliances, a table about 2 feet 6 inches wide, a bowl of very cold water in which a few grains of permanganate of potash have been dissolved, and a couple of clean dusters, are required.

As the object of caponing is to make large birds, only those which belong either to the table or the general purpose class should be used. Cockerels from ten to twelve weeks old are best for the purpose. As the abdominal portion of the body has to be opened, it is advisable to starve the birds for twenty-four hours so that the intestines may be practically empty.

The cockerel is taken, and the noosed end of the cord attached to one half brick is passed over the wings and tightened at the shoulders; the other is fastened round the legs above the hocks. The bricks are then dropped over the sides, the left side of the bird resting on the table. The area which has to be plucked is doused in cold water, and the feathers are pulled out. The effect of the cold water is to deaden the sensitiveness of the skin, and thus the bird hardly feels any pain. One of the

dusters is now taken, soaked in cold water, and folded so that it forms a strip some two inches wide, and this is placed over the feathers in front of the plucked area.

The most difficult part of the operation is to locate the exact position for cutting. Great care must be exercised in finding it. To describe it, we must touch on the question of the anatomy of the fowl. There are seven ribs on either side, springing from the back bone. The first two of these, counting from the front of the bird, are loose ribs—that is, they are only attached to the back. The remaining five spring from the backbone, take a backward direction at first, then turn at an angle of about 120 deg., go forward and join the sternum. It is only with the two last ribs on either side—those nearest the thigh—we have to deal, and in the case of, say, an Orpington at twelve weeks old, the section attached to the backbone is about $1\frac{3}{4}$ inches long. The cut has to be made between the two last ribs from the backbone to the point where they turn to go forwards. The membrane which separates the thoracic from the abdominal section of the body is attached to the sixth rib, and therefore if the cut is made between the fifth and sixth ribs the lungs will be touched, and it will be next to impossible to take out the testicles. Cutting into the thoracic portion of the body, and even cutting the lung, does not often cause death, but as a second cut will be necessary on the same side great care should be taken to find the exact position at first.

Pass the first finger of the left hand, commencing at the thigh, towards the front of the bird until the seventh rib is reached, pass over this, pressing the nail between it and the sixth rib just about midway between the backbone and the angle of the ribs. Holding the finger firmly in position, the point of the knife—with the cutting edge towards the breastbone—is inserted to a depth of half an inch and a cut made to the angle of the ribs. With the finger still in position, the knife is taken out, turned round with the cutting edge to the back, re-inserted, and, removing the finger, the incision is continued with the knife vertically until the backbone is reached. The reason for holding the finger between the ribs during both cutting operations is that, the skin being loose, it may move and the cut be made in the wrong place.

The spreaders are next inserted, the seventh and sixth ribs being held in the two hooks of that instrument. Surrounding the organs in the abdominal portion of the body is a fine membrane. It may happen, and we generally succeed in doing it, that this membrane has been already severed by the first cutting; if not, the knife must be again used, but with caution for it lies very close to the intestines. If there is sufficient blood in the body to make the organs indistinct, this should be soaked up by means of the sponges. In all probability, if the bird has been well starved, the right testicle will be in view. It is a small bean-shaped

organ, yellow in colour, and is attached to the backbone. If not, by means of the forceps, the intestines should be pushed gently towards the breastbone, and this will bring it into view. Taking the forceps in the right hand, they should be inserted, slightly opened, with the ring blade towards the testicle, and a firm grip taken of that organ. With a half turn the connection is severed, and the forceps with the testicle withdrawn.

We have suggested that the cut in the first place should be made as large as the length of the ribs allow, and we believe it best for novices to do this, but it is advisable, after a few birds have been done, to make as small an incision as possible. With a large wound it is wise to put in one stitch to draw the skin together, and for this either a surgical or an ordinary needle, slightly curved, and white silk should be used. Only the skin must be sewn for if the flesh covering the ribs be taken up, the slightest movement of the fowl will tear it apart. When sufficient practice enables the operator to work with a small opening, it is better not to stitch the skin at all. A gas is given off from the inside of the body, and if the wound heals too rapidly the bird will become puffed up, and to allow for the escape of the gas the skin will have to be pierced.

To take out the second testicle the operation is repeated in a similar way on the other side of the body. As soon as the operation is over, the bird should be placed in a small coop littered out with clean straw. For a couple of days a small amount of food should be given five times a day. It is unwise to allow the bird to fill its digestive organs until the wound is partially healed. The best food we have found is soaked biscuit-meal, dried off with toppings or ground oats, with about 10 per cent. meat-meal added. After two days the bird can be given its liberty, but it is better if it is not allowed to perch for a few days longer. The birds recover very rapidly from this operation, and the death-rate is low. A proficient operator will not lose more than 2 per cent., and frequently a whole season will pass without any mortality at all. About five weeks before the Christmas demand commences the fowls should be picked up and fattened.

RICE PRODUCTION IN U.S.A.—The production of rice in the United States during the last few years is stated to have been as follows:—In 1901, 388,000,000 lbs.; 1903, 560,000,000 lbs.; 1904, 586,000,000 lbs.; 1906, 496,000,000 lbs.; 1907, 520,000,000 lbs.; 1908, 608,000,000. Louisiana produces 53 per cent. of the rice grown in the United States, and Texas 42 per cent.

Natal Agricultural Union.

PROCEEDINGS OF THE ANNUAL CONFERENCE.

(Continued from Page 428.)

THE following reports by the Government Bacteriologist (Mr. H. Watkins-Pitchford) and Chief of the Division of Entomology and Horticulture (Mr. Claude Fuller) were laid before the Conference:—

MR. FULLER'S REPORT.

CITRUS EXPORT.

The citrus export has now extended over three seasons, and in this experiment the Government has been the moving spirit, supplying the funds to enable the first, and conducting the second and third. The results are such as to justify the expenditure involved, and even to palliate the bitterness of losses experienced, because we now know exactly where we are in regard to citrus culture and export, facts which might otherwise have taken many more years to establish, and, perchance, not then altogether satisfactorily. It is to this phase of the question that I would now confine my remarks.

First.—The most important development has been the discovery of a form of citrus decay apart from the well-known green and blue moulds. The organism which plays this important role is new to science, and has but recently been investigated by the Transvaal Mycologist.

The development of this trouble goes a long way towards explaining the great amount of wastage which occurred in last season's shipment, and has a very important bearing upon the methods to be adopted in future. The decay is popularly named "Black Rot," and its structure, life history, and characteristics are fully dealt with in Science Bulletin No. 4 of the Transvaal Department of Agriculture, in which it is technically described as *Diplodia natalensis*.

The remarkable features of this new fungus pest are given by the Transvaal authority as follows:—

- (1) Natural infection can occur through the stalk end of the fruit, even after it has been plucked for as long a period as ten days.
- (2) A slight abrasion to the rind of healthy fruit (ripe or green) is sufficient to permit an entry of the fungus.

- (3) The fungus commonly gains its entrance to the fruit at its point of detachment from the stem.
- (4) The dangerous nature of the disease lies in the fact that fruit infected in the above manner may remain as long as 10 to 15 days before any signs of infection are apparent.
- (5) The disease is carried over from season to season by means of mummified fruits lying about the orchard.

From what little information I have been able to collect, it does not appear to me that the disease originated last season. What seems more probable is that it is some soil mould, probably indigenous, whose attack and prevalence upon citrus is subject to seasonable influences. There is every reason to believe that the late rains experienced had considerable bearing upon the outbreak, not perhaps to be attributed so much to the effect of the rains upon the development of the fruit, as to the distribution of the spores from the soil spattered up with the dirt into the trees, as is so much the case with Brown Rot in California.

I have ascertained that the disease is more prevalent in some orchards than in others, and it appears to be practically confined to the coast-belt.

Second.—The packing of fruit for export in one centre has, of course, never been seriously entertained by me. Our 1908 experience seemed to show that it was, to some extent, feasible, but under the strain and conditions of 1909 it broke down altogether.

If for no other reason, the discovery of the above-mentioned diseases calls for the abandonment of centralised packing of coast-grown citrus. Further, a central institution could never be made self-supporting under existing conditions, which have been put to the test, without penalising export.

Central packing-houses in districts devoted to oranges and removed from the coast belt, run upon co-operative lines, will become desirable in time, but anything of the sort for naartjes I cannot recommend.

Third.—The oversea export of lemons is sufficiently demonstrated to be unprofitable. In the culture of lemons for South African markets there is room for extension, but in this pursuit up-to-date methods in handling and curing are absolutely essential. The common rough lemon should be abandoned, and cut out from all commercial orchards.

Fourth.—The export of coast-grown oranges has proved too hazardous. The fruit produced under the prevailing soil and climatic conditions is exceptionally delicate, and will not stand the strain laid upon it. Taken as a whole, coast oranges, whilst of exceptional flavour, are not of all up to export standard. However, in size, colour, and carrying qualities, they may yet be improved by attention to manuring.

Fifth.—The export of upland oranges, especially from the Richmond-Maritzburg-Greytown belt, has been attended with success, and orange culture in this region will stand extension for export purposes, particularly as regards Navel oranges. Growers must be careful to select good sites, good types, and upon no account to plant seedling varieties in proximity to Navels.

For local markets the Du Roi (so called here) is proving a promising variety, chiefly owing to the lateness of its season.

Sixth.—The anticipations of building up a large export of naartjes give no promise of speedy realisation. It can be said with much justification that, for the present, at any rate, the prospects of export do not warrant any unusual extension of the area under this fruit. In other words, with proper management, the orchards of to-day will meet the export requirements of some years to come at best.

The London market is limited so far as profitable prices are concerned, to what can only be regarded, from the export point of view, as a very small affair. It has further limitations, insomuch that the season of summer fruits thereupon coincides with the time of arrival of the bulk of the crop; prices tumble down rapidly, and then only the best quality of naartjes command a market.

There is, of course, no doubt that shipments of, say, one to three thousand trays per week, timed to arrive before and up to the advent of strawberries and cherries will prove profitable. Our early fruit most certainly carries the best, but naturally early shipments are limited. Subsequently, when naartjes are most abundant, exporters must be circumspect lest the fall in prices, bound to come about, swallow up their earlier profits.

PINEAPPLE EXPORT.

With regard to pineapple export, I regret to say that so far no development has followed upon the experimental shipments. Whilst it is hoped to do further work along this line in the near future, it must be said that it is a matter which rests almost entirely with growers.

It can be said with a great deal of assurance that it is only a question of producing a larger fruit of the Natal pine (weighing two pounds and over), to develop a large and important export of pines from this Colony. I am not enamoured with the prospects of exporting the large smooth-leaved Cavenne, but in the small Natal or Golden Queen there are opportunities which should not be neglected, for this variety stands unsurpassed for flavour.

MISCELLANEOUS FRUIT EXPORT.

The export of summer fruits is a matter which does not hold out much promise of a great future. The climatic conditions are such that good

carrying fruits can hardly be produced. If any development is to take place in this direction it is, I fear, only in connection with early plums and late apples. Given freedom from hailstorms, we have grand apple-growing districts, but hailstorms are hailstorms. In connection with this particular vagary of the elements, numerous enquiries have been set on foot, but little of value has been ascertained, and hail prevention seems, as ever, in the clouds.

Experiments are now in progress in connection with hail-guards for fruit trees, but at present it is difficult to say whether such can be obtained sufficiently inexpensive to justify their use.

In the export of avocados and mangoes there is promise of a small and remunerative export, but these lines require further exploitation.

I am glad to say that a small union has now been formed of mid-land orange growers interested in the continuance and development of orange export. The membership is at present small, but each member has agreed to export as many or more oranges than he shipped to Europe last season.

I would like to say that, in my opinion, a good deal could be done in Natal towards the development of an industry in first-class preserves and crystallised fruits, and encouragement of such industries would be perfectly justifiable, especially if inaugurated upon some co-operative basis.

LOCUSTS.

For the first summer during my term as Entomologist locusts have been a negligible quantity, no damage having been done by flyers or hoppers. Eggs were laid only in the Lower Illovo district and the resulting hoppers were all speedily destroyed.

It is thought by many that the locusts have disappeared in obedience to natural causes. Whilst I have always maintained that locusts will disappear from Natal for a time, as has happened in the past, to recur again at a later date in response to some natural law, there is no question but that our freedom from invasion this season and the comparatively small invasion of last season, is directly due to the effective hopper destruction which has been carried out in the north of us, *i.e.*, the North-Eastern Transvaal, in Mozambique, and, more particularly, in Swaziland, during more recent years.

WATTLE INSECTS.

Wattle insects have been particularly troublesome this summer, especially leaf-eating beetles. More important, however, is the phase assumed by a trouble known among growers as "frog-hopper." Some time has recently been given to the study of this development, but, as the life-cycles of two distinct insects have to be more fully investigated, and because either of them may be the direct cause, I am not now able to

make any decided statement. I am, however, hopeful that in the case of young trees spraying will be found both effective and profitable.

MEALIE-TOP GRUB.

In view of the divergent opinions held with regard to the life cycle and development of the mealie-top grub, some further field observations upon this pest were carried out in the spring. These were confirmatory of previous investigations, and it may be interesting to say that pieces of stumps and stalks collected from newly-ploughed lands at Thorny Bush as late as the 23rd of November contained over-winter larvæ. These were, of course, exceptionally late, and at the time they were taken, pupæ were found and adult moths were on the wing.

MEALIE WEEVIL.

I am glad to say that tanking and carbon bisulphide treatment for the control of weevil attack are both being generally adopted. Speaking broadly, all mealies when harvested should be regarded by the farmer as infested and treated accordingly. Primary weevil infestation is a very small affair, and up to a certain stage it is practically impossible for the farmer to detect it. I mention this because of the important bearing the matter has upon export because of the weevil test to which grain is submitted. If the least trace of weevil condemns a shipment, it is, to my mind, very much a matter of luck whether a certain lot of mealies gets away or not. For instance, A sends 500 bags; they arrive with but little delay on rail, the ship is waiting to receive them, they are examined, passed, and shipped. B sends a similar quantity, but they arrive at the port three days later, are passed, but unfortunately a week elapses before they can be shipped. Before placing on board, they are re-tested, when weevils are found. Strictly speaking, the first lot is just as much weevil infested as is the second, and were it examined in the ship's hold would be found to be so.

It must, therefore, be obvious that some account should be taken of the degree of infestation, if any justification for the same can be urged, especially in view of the enormous quantities of grain refused shipment because of very slight infestation.

It should not be difficult to relax the weevil test from September to January, for the very simple reason that, whatever the degree of infestation when placed on board, as soon as the ship gets north of the Equator into cold water breeding is brought to a standstill, and the weevils are practically all dead when the grain is landed.

POTATO IMPORTS.

Our Port inspection of plant imports has increased very materially of late. This is not only upon account of increased imports, but because of the far greater attention given to potato imports.

The recognition by the Transvaal authorities of certain potato troubles as being particularly pestivorous, and the economic importance of two hitherto little known potato diseases has brought this about.

Although at first importers and their European friends maintained that it was impossible to ship out perfectly sound potatoes, I have no hesitation in saying that a marked improvement in quality has been the immediate result. Of course, apart from any question as to whether or not these potato troubles are likely to become established and pestilent in South Africa, there has been the fact that an embargo upon Natal-grown potatoes has long been threatened by our inland neighbours, and so every effort has been directed towards preventing any such contingency arising.

GOVERNMENT REPLIES.

The replies furnished by Government to the resolutions forwarded to them that were passed at last year's Conference were then considered.

Mr. Mitchell asked what would happen to resolutions which it might be desired to return to Government for further consideration. What Government were they to be returned to? Would it be the Union Government?

Mr. Hyslop recommended that the resolutions be left in the hands of the Executive Committee, who could decide where they should be sent.

Mr. King thought that resolutions affecting South African matters might be singled out to be sent to the Central Government.

The President said that this might be done with regard to most of the resolutions, but as regards East Coast Fever, resolutions on that subject should be sent to the Central Government as soon as the latter was organised.

The Government's replies to last year's resolutions were then read.

TRANSPORT.

The following resolution was passed by the Conference last year:—

“That owing to the stopping of ox transport throughout the Colony, it is absolutely necessary for the Government to make adequate provision to supply the needs of the country with transport.”

The following reply was received from Government:—The Government has recently increased the number of East Coast Fever transport wagons from 32 to 62, with a view to coping with the requirements of the various districts in the matter of transport. The Government is also importing mules to farmers at cost price.

Mr. C. H. Mitchell moved that the resolution be returned to Government.

This was agreed to.

RE-STOCKING FARMS.

Last year's resolution on this subject was as follows:—

"That this Union resolves to again approach the Government with the view of obtaining assistance for farmers who have lost their stock through East Coast Fever, each farmer so affected to receive one hundred sheep on the existing hire system."

The following was the reply furnished by Government:—"It is regretted that funds are not available for the purpose of supplying further sheep to farmers on the hire system."

It was decided to return the resolution to Government for further consideration.

FENCING.

The resolution passed at the last Conference on this subject was:—

"That it is the opinion of the Union that the Government should immediately fence all main roads in such districts where East Coast Fever exists."

To this the Government replied that no funds had been provided by Parliament for the purpose of fencing main roads.

It was resolved that the resolution be returned.

BLUE TONGUE VACCINE.

Mr. G. T. van Rooyen moved, and it was agreed, that the following resolution be sent back to Government:—

"That this Union sympathises with those who have lost sheep through vaccination for blue tongue, and would suggest that in the interest of the sheep industry a full inquiry should be instituted forthwith, as far reaching effects are likely to result."

On the 2nd August, 1909, the Government, replying to the resolution passed last year, stated that enquiry which had been made in this matter had satisfied the Minister of Agriculture that the vaccine which had been issued from the Government Laboratory at Allerton had proved entirely satisfactory except in a few cases, in which special circumstances had to be responsible for the deaths which had occurred.

GATES ON MAIN ROADS.

The following resolution was passed by the Conference last year:—

"That this Union is of opinion that farmers should, with the approval of the local Advisory Boards and Public Works Department, be allowed to erect gates across main roads, and that they should not be compelled to keep guards on such gates, as is the case at present."

The following reply was received from Government:—"The matter of authorising or requiring the erection of gates across any main or public road has been placed entirely in the hands of the East Coast Fever Advisory Committee by Act No. 32, 1909, and Section 4 of that Act provides

that it shall be the duty of the Committee by whose orders any gate has been placed across a public road to place an attendant in charge of the gate at all times.

It was resolved to return the resolution to Government.

MEALIES IN TEN-TON TRUCKS.

It was decided to return last year's resolution on this subject to the Government. The resolution read as follows:—

"That this Union requests Government to so alter the rule in force on the N.G.R. with regard to the conveyance of mealies for export oversea that the grain for this trade may be carried in ten ton consignments instead of in twenty ton consignments as at present, at the special export rate, in order that producers situated at a distance from the railway line may have an opportunity of selling mealies for export, and benefitting by the reduced rate."

FIREBREAKS AND WATTLE PLANTATIONS.

The following resolution and reply on the above subject stood on the agenda paper:—

"That in the opinion of this Union the time has come when legislation should be introduced to compel owners of wattle plantations which abut on boundaries to be kept free of all grass, scrub, or other inflammable material for a distance of at least ten yards from the boundary lines, this also to apply to plantations abutting on railway lines."

Reply, 2/9/09: "That is a matter which will be considered in connection with legislation."

It was decided to ask the Government whether the matter had actually been considered in connection with legislation, and to supply the Conference with details as to the result.

LANDLORD AND TENANT.

The same course was decided upon with regard to the following resolution:—

"In the opinion of this Union the time has arrived when, with respect to Native tenants living on occupied farms, the landlord wishing the tenant to leave or the tenant wishing to leave the farm of his landlord, should by a notice of six months on either side be enabled lawfully to cancel the agreement between landlord and tenant."

The reply, which had already been received from Government, was as follows:—"Provision for a uniform period of notice similar to that recommended in this resolution is contained in a Draft Bill to amend the law relating to contracts entered into by native tenants residing upon private lands, and the correspondence relating to the matter awaits consideration by the new Council for Native Affairs."

MOTOR TRACTION.

It was decided to return the following resolution to Government:—

“That in the opinion of this Union the Government should introduce a motor to be driven by alcohol that would draw a two or three-furrow plough or take a wagon with ten or twelve bags of mealies on the road, so that small farmers might purchase such when proved a success, thus encouraging a colonial industry and helping farmers who wish to have a plant at less cost than steam engines.”

OTHER RESOLUTIONS.

Of the remainder of the resolutions which were passed at last year's Conference and forwarded to the Government, the following are the most important to which replies were received from Government and submitted to this year's Conference. The replies were passed over without discussion:—

BRANCH LINE RATES.—*Resolution*: “That this Union wishes to enter its protest against the present method of computing rates on the Natal Government Railways, and differentiating against the branch lines, whereby the inhabitants of outlying districts served by such branch lines are unfairly treated.”—*Reply*: “The present system of compiling rates over branch lines was introduced on August 1st, 1907, as it was found that in the case of branch lines the traffic was so light that the receipts did not pay working expenses, apart from their share of interest and sinking fund liabilities.

S.A.P. RATES.—*Resolution*: “That in the opinion of this Union the N.G.R. rates on agricultural products and live stock, especially small consignments, are detrimental to the interests of the farming community.”—*Reply*: “The reduction of the rates on agricultural produce, both in through and station to station traffic is at present under consideration with a view to a reduction of the existing charges.”

RAILWAY RATES ON LUCERNE.—*Resolution*: “That in the interests of lucerne growers, and consumers generally, this Union recommends that the railway rate on lucerne from Weenen and Greytown be fixed irrespective of cost at sending station.”—*Reply*: The special rates for lucerne from Weenen, Winterton, and Greytown, were introduced for the sole purpose of enabling the Natal producers to compete in the Durban market with lucerne imported by sea, and as statistics show that the local production of lucerne in Natal for last year was approximately 700 tons as compared with approximately 140 tons imported from Cape Colony, it is clear that the competition is not of a very serious nature, and Government does not see sufficient reason for withdrawing the stipulation that lucerne conveyed at the reduced rate should be subject to a certain maximum selling price.”

OBSTRUCTED BY-ROADS.—*Resolution*: “That in the opinion of this Union the owners of wattle plantations through which by-roads pass should be compelled to keep such roads free of growing trees, stumps and other obstacles dangerous to traffic.”—*Reply*: “It is considered that Section 22 of Law No. 35, 1901, sufficiently meets the case.”

GRUB IN MEALIES.—*Resolution*: “That this Union is of opinion that the serious consequences attending the spread of the mealie grub renders it necessary to take steps for its eradication, and therefore urges the Government to commence an investigation with this end in view.”—*Reply*: “The mealie grub has been very thoroughly investigated, and the most practical measures for its control have been pointed out repeatedly by the Government Entomologist. Later investigations conducted in Cape Colony have confirmed these measures as the most practicable and economic. Investigations in the natural economy of a somewhat similar pest in the United States also confirm these recommendations. The Government Entomologist is of opinion that no general good will be accomplished in the control until farmers can be persuaded to arrange for the removal of mealie stalks and stumps from the lands before the beginning of September.”

ENTOMOLOGIST'S WORK.—*Resolution*: “That the Government should make such arrangements in connection with fruit export as will ensure that the time of the Entomologist be devoted more to the investigation of diseases of mealies, wattles, potatoes, and other crops, than has been the case recently.”—*Reply*: “It is the object of the Government to at all times utilise the services of the Government Entomologist to the best advantage.”

EAST COAST FEVER.

The following resolution stood on the agenda paper in the name of the New Hanover Agricultural Association:—

“That this Union is of opinion that Government should withdraw all restrictions under East Coast Fever Acts and Regulations relative to the removal of cattle throughout the Colony, and respectfully urges Government to give effect to this resolution. In the event of this being impracticable, this Union is of opinion that the Advisory Board in each East Coast Fever Division be given full power (so far as the Board's own Division is concerned) to withdraw, at pleasure, all restrictions under East Coast Fever Acts and Regulations relative to the removal of cattle, and urges Government to give effect to this resolution.”

The President called upon Mr. Power, the Chief of the Veterinary Department, to address the Conference on East Coast Fever matters.

Mr. Power, in the course of his remarks, traced the course of the

disease. He said that the whole of Zululand was infected, and the same could be said of the Vryheid and Paulpietersburg Districts, as well as the Dundee District south of the Dundee-Vryheid line. Umsinga Division was also infected, including the Native location. There were no outbreaks in the Estcourt Division east of the main line of railway as far as the Department was aware. The Umvoti Division was pretty generally infected, and the same might be said of the Krantzkop Division. Victoria Division had been infected for some years. A certain portion was now considered clean, as no deaths had occurred for some two years past. The Umgeni, Camperdown, and Durban Divisions were all infected. A number of outbreaks had occurred in the Bargville District lately. There had been a couple of outbreaks recently in Winterton Settlement. In the Estcourt Division all south of Location No. 1 and to a great extent east of that location was practically clean. As regards Richmond District, the disease had spread very considerably during the past few months. The Camperdown District west of the line was also pretty generally infected. The disease had spread very rapidly lately in the Ixopo District; there were outbreaks all over the district. The Alexandra County was comparatively free.

In reply to a question, Mr. Power said that East Coast Fever was not abating at all. He also said that the percentage of recovery had in some exceptional cases been as high as 25 or 30 per cent., but this was quite exceptional.

Mr. Van Rooyen asked whether Mr. Power thought East Coast Fever had been stopped in its spread by fencing.

Mr. Power said that he did not think fencing had been a failure. Good fencing was the best means of checking the spread of the disease.

Mr. Van Rooyen also asked whether there were any cattle in the Colony which could be considered as naturally immune.

Mr. Power said there were such cattle. In reply to another question (by the President) as to whether he considered it possible to frame regulations to stop the spread of the disease, Mr. Power said he considered that the greater part of the Colony would become infected. New regulations were now being considered by the Government, but, of course, he could not say what would be decided upon. Replying to further questions, he said that farms might be considered clean fifteen months after the last death. Calves of salted cattle were just as liable to contract the disease as any other calves. The movement of cattle was responsible for the greatest number of fresh outbreaks; and in his opinion the action of the Government in stopping the movement of cattle had not been futile. Whilst, however, he considered that the movement of cattle had been the chief cause of the spread of the disease, it did not necessarily

follow that he considered it was the only cause. He believed in dipping, but he did not look upon it as a method of preventing the appearance of the disease in a herd, as if infected ticks were carried on to a farm by any means and attached themselves to cattle outbreaks of the disease were bound to occur. Where, however, dipping had been carried out thoroughly for some time before a farm became infected, the losses were considerably minimised owing to the reduction in the number of ticks, therefore all farmers should dip, as, even apart from East Coast Fever, it was necessary in a tick-infested country like Natal.

In reply to Mr. Smallie, he said that if there had been no restrictions on the movement of cattle the disease would have spread far more rapidly than it had done. In reply to another question, he said he saw no possibility of eradicating the disease unless fencing were continued.

In reply to a question by Mr. Mitchell as to what his future programme would be until the Central Government took control, Mr. Power said that he was not in a position to say definitely. He was, however, opposed to relaxation of the restrictions: their abandonment would cause a greater spread of disease and remove protection from those who had so far saved their cattle. The general position would not be improved; those districts which were, so to speak, swept by the disease three or four years ago were not yet clean.

In reply to Mr. Dick, he said that it was too late to try to eradicate the disease by general stamping out. Newcastle was one of the divisions where stamping out might be successfully carried out. He was still in favour of stamping out in certain cases. He also said, in reply to Mr. Bazley, that so far as he knew no methods of inoculation had yet proved effective or at present appeared to offer any hope of success. The Department was at the present time testing the Oosthuizen system of inoculation, but no very encouraging results had yet been obtained. They would be in a position to make a pronouncement, however, very soon. He said, in reply to another question, that there was no danger involved in the transportation of hay from a farm which had not had the disease for fifteen months. Another delegate asked approximately how many cattle had died from the disease. Mr. Power said that about half the cattle in the Colony had succumbed—half the number there were in 1906.

At this point a resolution was then passed urging the Government to inform the Union as early as possible who would act as Minister of Agriculture in Mr. Deane's absence.

Mr. Hancock moved a resolution to the effect that the Government be asked to inform the Union of the nature of the new regulations for the control of East Coast Fever which the Government were considering.

Upon the motion of the President, it was decided to ask the Government to supply that afternoon an advance copy of the regulations which had been drafted. The motion having been adopted,

A vote of thanks was unanimously passed to Mr. Power for his attendance and his explanation.

Further consideration of East Coast Fever matters was deferred pending the receipt of a copy of the new regulations which the Government proposed to put into force for the control of East Coast Fever.

LYMPHANGITIS COMPENSATION.

Mr. Mackenzie moved, on behalf of the New Hanover Agricultural Association:—

“That an Act should be passed providing for compensation being paid to owners of horses and mules slaughtered by Government on suspicion of lymphangitis, and that compensation should be paid whether the slaughtered animal is found to be suffering from lymphangitis or not.”

Mr. D. C. Dick seconded.

Mr. Power (Chief of the Veterinary Department) said that the Government was doing practically what was asked by the resolution.

In view of Mr. Power's explanation the resolution was withdrawn.

LAW COSTS AND PROCEDURE.

Mr. C. H. Mitchell, representing the Lower Umzimkulu Agricultural Association, moved:—

“The Union would call the attention of the Government to the present great difficulty and cost of obtaining access to the Law Courts of the Colony, and would urge, in the interests of justice, for far greater simplicity in the modes of procedure and substantial reductions in the fees charged and allowed.”

Mr. Hosking suggested that the Government be also asked to appoint Justices of the Peace in outlying districts to hear and decide upon cases.

The motion was carried.

RAILWAY MATTERS.

EQUAL CHARGES.

Mr. Mitchell moved, on behalf of the Lower Umzimkulu Agricultural Association:—

“That, in the opinion of this Union, the same charges should be made by the railway for conveying similar classes of goods over equal distances of line, whether the gauge be broad or narrow, and all charges for transshipment from one gauge to the other should be borne by the general railway revenue.”

The resolution was carried.

CARRIAGE ON SALT.

Mr. Woods moved, on behalf of the Mooi River Farmers' Association:—

"That, in the opinion of this Union, salt in quantities of not less than one ton should be conveyed on the N.G.R. at fertiliser rate."

Mr. Blaker seconded.

Mr. Oldacre suggested that full information should be obtained as to the railway carriage on salt.

Mr. King thought that the resolution should be withdrawn, in view of the large reductions which had been already made by the Railway Department.

The resolution was lost.

The delegates of the Dronk Vlei Association withdrew the following motions which stood on the agenda paper in the name of their Association:—

(a) "That, in the opinion of this Union, owing to the heavy charges imposed per rail on small consignments of Colonial produce, such as eggs and butter, business in this direction is discouraged when long distances are concerned, and suggests that the Railway Department be asked to provide a remedy."

(b) "That, in the opinion of this Union, the minimum charge on all small parcels by rail be reduced."

DEMURRAGE ON CATTLE TRUCKS.

Mr. Marwick, representing the Richmond Agricultural Society, moved:—

"That the Railway Department be approached with a view to obtaining redress with reference to the charges made for demurrage on cattle trucks, and the inconvenience and loss caused by the Department not supplying the necessary trucks at the stipulated time."

Mr. Blaker asked why the farmer should have to pay for trucks when at the port there were miles of coal trucks waiting to be emptied and on which no demurrage was paid. The coal-owners were thus allowed to store their coal in Government trucks instead of building sheds for the purpose.

Mr. Fleming referred to the want of kraals for cattle waiting at stations to be trucked. Often cattle could scatter all over the neighbouring veld and so spread disease.

Mr. King pointed out that local management had a lot to do with the matter of supplying trucks. He agreed that there was a shortage of trucks on the railway, but at the same time he blamed the railway management for not making earlier provision.

Mr. Wiltshire referred to the bearing of the coal industry on the

subject. He said that the concession to the coal-owners was a very necessary one, on account both of the importance of the industry to the country and of the friable nature of the coal owing to which the value of the coal was liable to deteriorate by too frequent handling. He thought the colliery owners were only too willing to adapt themselves to the requirements of the country. He referred at length to the value of the coal industry to the Colony.

Mr. Mitchell asked what the amount of demurrage charged was.

Mr. Marwick said that the charge was 8s. per truck.

The motion, on being put to the vote, was carried by 18 votes to 17.

RATES ON WATTLE BARK.

The delegate for Seven Oaks Farmers' Association moved:—

"In the opinion of this Union the railway rates on wattle bark, particularly stick bark, are too high, and should be reduced by the railway authorities."

The mover thought bag bark should have preference over stick bark.

The Secretary announced that reductions had been made in the rates of bark, and in view of this fact the mover decided to withdraw the resolution.

CASH PAYMENTS.

Mr. Blaker moved, on behalf of the Mooi River Farmers' Association:—

"That this Union is of opinion that the Railway Department should withdraw the regulations whereby payment in cash for each consignment of goods before it leaves the shed is enforced, and recommends that a certain amount of discretion in collecting of such charges be left with stationmasters."

The resolution was lost.

AGRICULTURAL SOCIETY GRANTS.

The following resolution stood on the agenda paper in the name of the Umvoti Agricultural Society:—

"That, in the opinion of this Union, the Union Government should be asked to continue the support to Agricultural Societies as liberally as in the past."

Mr. Mitchell said that he understood from the Under Secretary for Agriculture that the question of making grants to the Agricultural Societies this year was being considered by Government. The amounts would be the same as those granted the last year in which grants were given.

Mr. I. M. van der ... said that they nevertheless had no guarantee that grants would be given annually by the Union Government. Speaking

to the above motion, he said that the Agricultural Society was one of the best advertisements that the Colony could have.

Mr. Woods said he would vote against the resolution. They could make no suitable show without cattle, and he thought the money would be badly expended.

Mr. Van Rooyen said he was surprised that such an experienced farmer as Mr. Woods should make such a statement. Mr. Woods was a great breeder of sheep and horses and other classes of stock, and surely these were worth showing? Why should they be inclined to abandon their shows because they could not exhibit cattle?

After some discussion the motion was withdrawn.

JACKALS IN GAME RESERVES.

Mr. Blaker moved, on behalf of the Mooi River Farmers' Association:—

“That, in the opinion of this Union, the Government should be approached to permit of jackal hunting in game reserves.”

He said that they found that the jackals had increased to such an extent that they were not able to do much to keep these animals under, and their efforts were to a great extent nullified by the appearance of jackals from the game reserve. If they had permission to hunt these jackals in the game reserve it would do much to lessen the pest.

Mr. Green said he knew for a fact that the Government would place no obstacle in the way of any who might desire to hunt in the game reserve.

Another delegate said they wanted a free hand to go into the game reserve to hunt whenever they liked without having to get a special license.

The resolution was withdrawn.

OBNOXIOUS WEEDS.

Mr. Blaker moved, on behalf of the Mooi River Farmers' Association:—

“This Association views with alarm the enormous spread of obnoxious weeds in this district, on town lands, public roads, and private roads, and urges the Government to be most stringent in their effort to eradicate same, the Scotch thistle especially.”

He said it was a difficult matter to keep their farms clean when the Government roads were infested

Mr. King suggested that it would be better to ask the Government to reinforce the Noxious Weeds Act.

Mr. Sykes said that down on the coast the Government had put that Act into force.

On the motion of Mr. Mitchell, it was agreed to replace the resolu-

tion by the next resolution on the agenda—to be introduced by the Dronk Vlei Farmers' Association—as follows:—

“That this Union is of opinion that the attention of the Government should be drawn to the rapid spread of burr weed—*Xanthium spinosum* and *X. strumarium*—with a view to its eradication on roads, reserves, and other Government lands.”

Mr. King moved the following amendment:—

“That the Government be requested to re-inforce the Noxious Weeds Act, always provided that the Government undertake to keep the public roads, railways and public lands clean of these weeds.”

This amendment was carried.

THE SPARROW PEST.

Mr. H. E. Mingay moved, in the absence of any delegate representing the Camperdown Division Farmers' Association (in whose name the motion stood):—

“That this Union asks the Government to take immediate steps to eradicate the flocks of sparrows flying about Durban streets before they become a pest to farmers and others in the Colony, as they have become in other Colonies.”

Mr. Wood said the sparrow was not a harmful bird from the point of view of the farmer. At any rate, they would not be able to exterminate this pest. There were other birds in Natal which did much more harm.

Mr. Marriott said he was afraid Mr. Wood had forgotten the amount of damage which the sparrow did in England. These birds did tremendous damage to crops. They also drove all insectivorous birds right and left. He thought they would be a terrible pest to this Colony, such as it was already in Australia and the United States.

Mr. Sykes said the Durban Corporation were paying 3d. for every sparrow brought to them, and he thought this action would go a long way towards eradicating the pest.

It was moved that the resolution stand down until the next day.

RUST-PROOF WHEAT.

Mr. Marriott moved on behalf of the Dronk Vlei Farmers' Association:—

“That this Union is of opinion that the importance of wheat production in this Colony is such that the Director of the Cedara Experimental Farm should be instructed to renew his efforts to discover a rust resisting wheat that may be cultivated without irrigation in Natal, and suggest that the Director should send samples of seed wheat to various Associations to test which is the best rust-proof wheat, with a view to ascertaining the best varieties for each district.”

¹ The resolution was carried unanimously.

LABOUR MATTERS.

Mr. Bernard Greene, representing the Nottingham Road Farmers' Association, moved:—

"That this meeting, representing the farmers and planters of the Colony, desires to impress upon the Government the very urgent need for the immediate organisation of the labour supply of the Colony ere indentured Indian labour is finally withdrawn, and the Colony's agricultural and other resources largely crippled."

Mr. King seconded.

Mr. Woods thought it would be a very good idea to indenture the "skibengas" that were giving trouble in the towns—this to take the place of punishment by imprisonment.

Col. Addison, speaking as a member of the recent Indian Labour Commission, thought an attempt should be made to make use of the Native boys who had drifted permanently to the towns, deserting their parents and contributing nothing to their upkeep. These boys might be indentured. He thought it should be made compulsory. Indentures might be for a term of three years; after which the best of them might be re-indentured to higher work than ordinary field work.

Mr. Marriott, in supporting the motion, suggested that part of the wages be handed over to the parents of the boys and part to the boys. He thought that a system of indenturing was really necessary in the interest of the Natives themselves.

Mr. I. M. van Rooyen said he did not think that anything effective could be done in regard to the Native labour question until they had uniform laws throughout the Union.

The resolution, upon being put to the vote, was carried unanimously.

DESTRUCTION OF SPARROWS.

Reverting, on the second day of the Conference, to the motion *re* extermination of sparrows, which stood down the previous day on account of the absence of the representative of the Camperdown Farmers' Association,

Mr. J. Moon said the time had come when the systematic destruction of sparrows must be taken in hand, ere they became an uncontrollable pest. He dwelt upon the large amount of damage which was done by these birds in America and England.

Mr. Gray said the sparrow was now all over the Colony, and he understood that it had also made its appearance in the Free State.

Mr. Hancock said he did not think that the bird Mr. Gray had in mind was quite the same species as the English sparrow; but at the same time he would support the resolution as he recognised the danger to the

Colony in allowing the English sparrow, which was already in the country, to spread.

Mr. Marwick moved the following amendment:—

“That this Union request that the Government take immediate steps to eradicate the flocks of English sparrows flying about before they become a pest to the farmers and others in South Africa.”

Mr. Moon agreed to the substitution of this amendment for his original resolution.

The resolution was carried unanimously.

ABSENCE OF GOVERNMENT OFFICIALS.

Attention was drawn by one of the delegates to the absence of officials of the Agricultural Department, who had been invited to attend. A discussion took place on the matter, and the following resolution was passed:—

“That Heads of the Agricultural Department be sent for when they are required to be present for special resolutions.”

MANUFACTURE OF AGRICULTURAL REQUIREMENTS.

Mr. D. C. Dick, representing the Royal Agricultural Society, moved:—

“That the Government be requested to take into consideration the advisability of encouraging the manufacture of agricultural requirements, including fertilisers and machinery, within the Colony by subsidy.”

He considered that the manufacture of agricultural implements required in Natal might easily be undertaken here. Manufacturers, however, were not able to compete with the oversea producer, and he consequently thought that a system of subsidies should be instituted.

Mr. King considered that the proper method of encouraging manufacturers was that of protection, and not by bonuses or subsidies. Protection, however, was of no use unless it was adequate. He said that the tendency in imported machinery was to become worse and worse, especially in American machinery.

Col. Addison also thought that the encouragement of the local manufacture of implements should take the form of protection rather than subsidies.

Mr. Hancock pointed out that the establishment of a local manufacture of implements might tend to raise the cost of the farmer's working plant, which would mean the lessening of the margin of profit on production.

Mr. Wood adopted the same line of argument. A heavy protective duty would be necessary, which would considerably enhance the price of implements to the consumer.

Col. Leuchars said the difficulty could easily be got over by the establishment of subsidies. This would give a chance to manufacturers to establish an implement industry, and they would then probably in time be able to do without both subsidy and protection.

The resolution was carried.

REPAIRS TO ROADS.

The delegate of the Weenen Agricultural Society moved:—

“That this Conference is of opinion that the roads of the Colony require better attention by way of repairs, and that the Government be requested to provide further road parties for that purpose.”

He said that during the period of retrenchment most of the road-parties had been taken off, but it was time they were replaced.

Another delegate blamed the road superintendents in many cases for the present state of the roads of the Colony.

Mr. King moved the addition of the words, “and where possible both construction and repair be done by contract.”

Mr. Kirkman moved the substitution of the following words for those after “by way of repairs,” *viz.*: “and that the Union urge that a permanent hardening of the drifts and roads is most desirable.”

Mr. Barnes, Chief Engineer, F.W.D., then addressed the Conference by request. *Inter alia* he agreed with the suggestion that it was most desirable to harden the drifts. Also he dwelt upon the need for improving the grade of roads, but he said that the total vote for roads this year had only been £7,000, which was not sufficient. He disagreed with the suggestion that the road superintendents were at fault. He said that a lot would have been done by the end of the present season in the way of repairing roads. He gave his assurance that he would do his best to foster the contract system, within limits. He said that it would be a great help to his Department if farmers’ associations would draw his attention to any road improvements which might be desirable.

The mover of the original resolution withdrew his motion in favour of Mr. Kirkman’s amendment.

The motion as amended was carried.

TYRES OF VEHICLES.

Mr. Dick moved on behalf of the Royal Agricultural Society:—

“That in the opinion of this Conference the width of tyres on the wheels of vehicles used for transport within the Colony should be regulated as follows: For vehicles carrying two tons or less a minimum width of $2\frac{1}{2}$ inches, and for every ton in excess of that weight $\frac{1}{2}$ inch additional in width. This to come into effect after a date to be specified by Government, and builders to be instructed accordingly. That Government should be requested to take immediate steps to give effect to the foregoing.”

Mr. Dick said he would like to ask Mr. Barnes for his opinion as to the minimum widths of tyre which should be adopted for various tonnages.

Mr. Barnes thought the measurements given in the motion would answer all requirements. These tyres would have the effect of a roller rather than cut up the roads.

Continuing, Mr. Dick said they had asked Government at various times to do a great deal for them, and it was time they offered to do something in return, and this they could do by passing the present resolution, the suggestions contained in which would, if adopted by the Government, prove of some assistance to the Government by lessening the cost of the upkeep of roads. The suggested regulations would only be enforced in the case of heavy loads of produce. He had consulted the wagon makers of the city, and he had found that the enforcement of such regulations would not prove a hardship to them, as had been suggested.

Mr. Bazley considered that the adoption of wider tyres would have the effect of tearing up the roads even more than the tyres at present in use, be reason of the fact that skidding in wet weather would be rendered easier.

Rev. Jas. Scott also spoke against the resolution.

Mr. Hancock was in favour of the increasing of the width of tyres.

Mr. Wood considered that the best method of dealing with the matter would be to adopt the old English system of putting a tax on all wheels whose tyres were under certain dimensions.

Mr. Lund thought the idea of the resolution was valueless. In wet weather they could easily put a smaller load on their wagons than they did in ordinary weather.

The resolution was lost.

GRANT TO THE UNION.

Mr. Hosking, representing the Royal Agricultural Society, moved:—

“That in the opinion of this Union the time has now arrived when Government should be asked for an annual grant of £1,000 to the Natal Agricultural Union.”

He said such a grant would enable the Union to subsidise industries and become of more benefit to the Colony generally. He did not ask for the money as a grant towards the defrayal of the ordinary expenses of the Union.

Mr. Mitchell said that the Transvaal Agricultural Union had for many years been in receipt of £1,000 a year from the Government towards the funds of the Union. He pointed out, however, that at the present time the Natal Union was an independent body, and that, if

they were in receipt of a Government grant, their hands would be somewhat tied.

The Rev. Mr. Scott also thought that the securing of a grant from Government would destroy their independence as a Union (dissent). He said he had not yet made up his mind which way to vote, but the financial position had to be faced. If funds were not obtained from Government they must be obtained elsewhere.

Mr. King suggested that the Government should grant free passes for delegates travelling to the Conference, rather than give a lump sum of money.

Mr. Marwick supported Mr. King's view. He did not like the idea of approaching Government for the money necessary to run their Union. He thought they should endeavour to find some other means of raising the money.

Mr. Kirkman considered they should endeavour to enter Union on the old lines upon which they have always run. Under Union, if the Transvaal Agricultural Union received a grant they could be quite certain that Natal would benefit to the same extent.

Mr. Moon said it was just a temporary depression which the Agricultural Union had entered into. He counselled endeavouring to do without Government assistance. They must find a way to get out of their difficulties, without going to the Government.

The President explained the causes which had brought about their present temporary financial difficulties. They had been abnormal causes.

The Secretary, in reply to a question, outlined the financial position of the Union.

One delegate suggested that the Government be approached for funds on the £ for £ principle.

Col. Leuchars thought that, in view of the fact that the Government grants were to be resumed this year, societies might be asked to assist the Union from the funds thus provided. He moved an amendment to this effect, fixing the proportion at 10 per cent.

Mr. Bernard Greene proposed that the rates of subscription of affiliated associations be doubled.

On the motion of Mr. Hesking, the debate was adjourned until the following day, in order that delegates might have time to consider the whole subject.

ELECTION OF OFFICE-BEARERS.

The election of office-bearers was proceeded with on the afternoon of the second day. The following were appointed:—

President, Mr. E. W. Evans (re-elected); *Vice-President*, Mr. I. M.

van Rooyen; *Secretary*, Mr. D. M. Eadie (re-elected). *Executive*: Northern District—Messrs. J. G. Bester, Wiltshire, Oldacre, Smallie, and Von Levetzow. Midlands—Messrs. J. Marwick, O. Hosking, J. King, J. Moon, and Rev. J. Scott. Durban and Coast—Messrs. C. H. Mitchell, H. Bazley, J. Burman, W. Sykes, and J. Kirkman.

The following delegates were appointed to represent Natal at the next Conference of the Inter-Colonial Agricultural Union (to be held at Capetown):—Messrs. C. H. Mitchell, J. Marwick, O. Hosking, H. Bazley, W. Comrie, W. J. S. Newmarch, Jas. King, I. M. van Rooyen, G. C. Mackenzie, A. von Levetzow, John Moon, J. G. Bester, H. Wiltshire, Col. Leuchars, and Rev. Jas. Scott.

TREE PLANTING COMPETITIONS.

Mr. O. Hosking moved on behalf of the Royal Agricultural Society:

"Seeing that the Committee appointed to carry out the tree-planting competition have secured enough money to continue this scheme for five years, it is the unanimous opinion of this Union that a fruit-tree planting competition should be started on the same lines, using the interest from the investment of the tree-planting competition fund, to offer similar prizes for the fruit-tree competition. Trees to be planted before September, 1911, and to be judged in December, 1915."

Col. Leuchars seconded, and the resolution was carried unanimously.

SPURIOUS SEEDS.

Mr. King moved on behalf of the Nottingham Road Farmers' Association:—

"That in the opinion of this Union the time has arrived when a general Act should be passed, embracing the whole of South Africa, securing farmers against the vending of spurious or diseased seeds and plants, or deficient fertilisers, and attaching full responsibility to the vendors on any proved failure of quality or description."

Mr. Greene seconded; and after a short discussion the resolution was carried.

EXPIRY OF IDENTIFICATION PASSES.

Mr. Marriott, representing the Dronk Vlei Farmers' Association, moved:—

"That Magistrates, in the opinion of the Union, should be instructed to state on the identification pass, according to permission granted by landlords, the date of expiry, and also on all outward passes if for less than twelve months."

Mr. Von Levetzow said there was a law to provide for this, but it was not effective.

Mr. King pointed out that the fault did not necessarily lie in the

law itself but rather in the regulations framed under that law. The regulations might be altered so as to give the required relief.

The motion was passed

EAST COAST FEVER (*Continued*).

At this point the President announced that a reply had been received from the Government regarding the report of the East Coast Fever Advisory Commission appointed under Section 5 of Act 20, 1910. The report was read by the Secretary, and ran as follows:—

The Commission sat on the 3rd and 4th insts., and, after discussion with the Minister of Agriculture, the Chief of the Veterinary Division, and the Secretary for Native Affairs, came to the conclusions embodied hereunder.

It was felt that under the circumstances of the Parliamentary vote of £100,000 and the imminence of Union, the most important step to be taken would be to check the spread of East Coast Fever to new districts.

It was accordingly resolved, and the resolution forwarded to the Minister of Agriculture:—

“That the Government be strongly urged to at once concentrate all efforts west of the line towards fencing with all speed all known outbreaks of East Coast Fever, then branding all cattle therein, with a view to their subsequent slaughter, compensating owners thereof, under Act No. 8 of 1907.

“The Commission further recommends that application be made to the adjoining Colonies to contribute towards the expense involved, including that of compensation.”

The Commission recommends that such isolated outbreaks as occur on the east of the line should also be treated in the same manner.

The Commission recommends that all unfenced railway lines in the Colony should be fenced.

It is felt that if the above recommendations are adopted by the Government, and actively carried out, the further spread of the disease can be checked, and the task of eradication under Union much shortened and simplified.

The Commission cordially approves of Act No. 20 of 1910, with the exception of Clause 4, regarding which an alternative suggestion is hereinafter made, and believes that the assistance thus rendered to farmers will be of the greatest service.

If, however, there is to be any hope of really controlling East Coast Fever, it is absolutely necessary to prevent the illicit movement of cattle.

The movement is chiefly carried out by Natives, and is the main cause of the spread of the disease.

Accordingly the following resolution was passed, and forwarded to the Minister of Agriculture, with the one already mentioned:—

“Resolved that the amount of £10,000 voted to the Natal Native Trust for East Coast Fever purposes be used exclusively and immediately on fencing and subdividing Native locations. Should this not be conceded, the Commission hopes that no other steps will be taken pending the presentation of its report in about two weeks’ time.”

The Commission deprecates the expenditure of any funds on other methods, until such fences are completed, when the other recommendations (branding and cleaning) hereinafter made should, in the opinion of the Commission, be made compulsory and universal.

The extent of the sub-division of locations referred to in the resolution would, of course, depend on the area, population, contour, water supply, etc.

It is further recommended that all fences around isolated outbreaks should be guarded or patrolled until such can be effectively dealt with, and, in addition that the Natal Police, or other body, should be called out to thoroughly guard all unfenced outbreaks until such time as the fencing in thereof can be effected.

The Commission is of opinion, in the event of the recommendations in regard to the fencing being carried out, that, together with the assistance to be rendered to farmers under Act 20 of 1910, as much as possible will have been done in the direction of combating the disease by means of fencing.

The Commission, feeling strongly that illicit movement is the greatest source of danger, and must be stopped at any cost, urges the Government to initiate legislation for the compulsory branding of all cattle in the Colony, on the lines laid down in the Transvaal Branding Law of 1904.

This law, if backed up by severe penalties for contravention and illicit movement of stock, would certainly check the spread of the disease, besides being a great service in preventing stock thefts.

It may be urged that the Natives will object to branding, but experience proves that illicit movement cannot be stopped in any other way, and the exigencies of the case demand its prevention.

The Secretary for Native Affairs, in giving evidence before the Commission, said that he realised the necessity of branding, and that, though the Natives would look upon it with suspicion, he did not anticipate any serious difficulty, provided the matter was left to him to explain to them.

The cleansing (by dipping, spraying, or hand-dressing) of cattle is finding greater favour daily, but it is still untried by a considerable portion of the white farmers and by almost all Natives in the Colony.

Its importance is so obvious, and the drawbacks so few, that the Commission is of opinion that its adoption should be made compulsory.

This will be no hardship when it is considered that a dip can be erected for £50, or a spray pump purchased for 20s.

The regulations contained in the *Gazette*, and adopted on the 12th May, 1908, by the Richmond Infected Area Advisory Board should be withdrawn, and the Commission recommends that the regulations embodying the following suggestions should be applied to the whole Colony:

(1) It is required that all cattle in the Colony be kept reasonably free from ticks.

(2) Stock Inspectors shall be required to inspect all herds in their districts as is done under the Scab Act, further assistance being rendered by other Government officials, duly authorised, such herds to be visited as often as the Department deems necessary.

(3) In the event of any herd being declared by the Inspector to be infected, the owner or person in charge of such herd shall be granted a licence for thirty days, during which no cattle be removed.

(4) At the expiration of this time, the Inspector shall again visit the herd, and if the cattle should be still infected, a penalty of £1 shall be imposed, succeeding breaches of the regulations at similar periods being subject to an increasing penalty of £1 for each licence.

(5) Penalty for obstruction, see Clauses 2 and 16 of the Scab Act.

(6) It shall be the duty of Inspectors to instruct Natives in locations and on farms unoccupied by Europeans, in the use of cleansing agents.

The suggested regulations provide the alternative to clause 4, referred to on page 2 of this report.

In this regard, the Commission is of opinion that, in the interim until the above regulations are adopted, Stock Inspectors and other officials appointed, should be instructed to refuse permits to remove cattle for any purpose whatever, unless they are satisfied that the whole of the applicant's cattle are reasonably free from ticks.

If the above recommendations pertaining to fencing, branding, and dipping or cleansing are carried out, and all persons, including Natives, treated alike, the Commission believes that it is not too late to control the disease.

There remain some comparatively minor matters to refer to.

Movement of Slaughter cattle from infected veld.—The Commission advises that movement of cattle from infected veld should be allowed

over infected areas only, and in no case over veld which is clean or in process of cleansing.

Destruction of stray cattle and illicitly moved.—The Commission is of opinion that action in this regard be left to the discretion of the Department, it being believed that black and white will be treated alike.

It is recommended, however, that where it is found necessary to give Natives short notice to sell any of their cattle which may have strayed, the Government should take them over at schedule rates to save owners being victimised by unscrupulous buyers as has happened in the past.

Sub-division of farms by the main line of railway.—The policy of considering the main line of railway as a boundary across which cattle are not allowed to pass should, in the opinion of the Commission, be continued and extended to the Cape-Natal and Stuartstown branch lines.

One dipping tank for two farms.—The Commission is of opinion that this should be allowed where fencing is to be erected as to preclude any chance of cattle mixing.

Provision for trucks.—The Commission considers that kraals should be erected by the Railway Department at all stations where cattle are entrucked as delay and dangers often occur owing to trucks not being available.

Movement of meat.—Great risk of spread of East Coast Fever is caused by the practice of the Natives removing meat from animals which have died from East Coast Fever, to which portions of hide adhere.

The punishment meted out to offenders brought before the Magistrate appearing to be inadequate to check the offence, it is suggested that the Attorney-General be asked to bring the seriousness of this offence to the notice of the Magistrates.

Movement of "salted" cattle.—Owing to the difficulty of ascertaining the immunity of such stock, and the consequent danger of re-infection, the Commission cannot advise that this should be allowed at present.

Calves from immune parents.—A considerable number of farms are now clear of the disease, with perhaps a few head of cattle remaining. All calves born from this immune stock will be susceptible to the disease, and so re-infect the veld; some method of dealing with the problem should be adopted, otherwise there will be danger of East Coast Fever becoming endemic as is the case in German East Africa.

The whole question is a most difficult one, especially in the case of Natives, and yet is one which must be fully and firmly dealt with.

Your Commission is not yet, however, prepared with a recommendation, but will consider the matter further at an early meeting.

The Government is advised to consider the question of purchasing and removing a quantity of breeding cattle to comparatively safe areas,

such as game preserves, with a view to re-stocking depleted portions of the Colony.

Mr. Otto's treatment.--A resolution was sent to the Minister of Agriculture on the 4th inst., and the Commission hopes that an agreement may be arrived at whereby the treatment may be fairly treated by the Government.

REMOVAL OF RESTRICTIONS.

Rev. Mr. Scott, representing the New Hanover Agricultural Association, moved:—

"That this Union is of opinion that Government should withdraw all restrictions under East Coast Fever Acts and Regulations relative to the removal of cattle throughout the Colony, and respectfully urges Government to give effect to this resolution. In the event of this being impracticable, this Union is of opinion that the Advisory Board in each East Coast Fever Division be given full power (so far as the Board's own Division is concerned) to withdraw, at pleasure, all restrictions under East Coast Fever Acts and Regulations relative to the removal of cattle, and urges Government to give effect to this resolution."

In moving, Mr. Scott hoped those who were opposed to the idea of this resolution would credit its supporters with as much public spirit as they themselves had. (Hear, hear.) What were the facts? Three or four years ago they were asked to draw fences here and there. Not in one case were those fences drawn, but in a few cases they found the disease on the other side of the fence. (Hear, hear.) The disease travelled very rapidly. The tick moved in a thousand ways that they had not believed it could do before. It was carried by cattle, mules, donkeys, game, birds; and he was positive that it was carried on the grass that was blown for miles by the winds. (Hear, hear.) If that was so, what was the use of going on with the regulations now in force. Thousands of pounds had been spent, but to no effect, as the disease was spreading from farm to farm and from district to district. Was it not time for them to reconsider the position? He was one of the strongest in favour of stopping the movement of cattle, but he knew a great deal more about the disease than he did about two years ago. *Re* immune cattle, he said that his own observation went to show that 10 per cent. was the average of recoveries. (Hear, hear.) Let them try something new.

Mr. Mitchell moved the following amendment:—

"This Union heartily endorses the suggestions made by the Advisory Commission, and urges the Government to carry out the same."

He said that the Commission had been appointed by the Government, and their own President had been made chairman. They had

taken evidence from all possible sources. He outlined the suggestions made by the Commission; and he pointed out that the Commission had expressed themselves strongly averse to any such proposition as that made by the Rev. Mr. Scott. It was all very well for men like Mr. Scott, who had lost nearly all their cattle, to throw up the sponge. He said that what the Prime Minister had said with regard to dipping was quite true—dipping was one of the best weapons they had for fighting the disease. (Hear, hear.)

Mr. Moon strongly supported Mr. Scott, who was an old colonist and knew what he was talking about. The removal of restrictions should be left to the Advisory Boards.

Mr. Scott asked leave to withdraw the first part of his resolution. (Applause.)

Mr. Newmarch said that there was probably not a better fenced county in the Colony than Umvoti County, and yet they had the disease in their county. He said that under the present circumstances the disease was being kept alive. What they wanted was clean areas.

Mr. L'Estrange said that it was quite evident that the Government had failed—they had practically admitted at the E.C.F. meeting in Maritzburg two and a half years ago. If that was true then it was even more true now; and he thought it was high time that the control of the disease be handed over to the farmers. (Hear, hear.) He was heartily in favour of leaving the question of movement of cattle to the Advisory Boards, who, as representative of the farmers, were in the best position to know what should be done.

Col. Rethman also expressed his strong approval of what Mr. Scott had said.

Mr. Bazley was strongly of the opinion that the regulation of the movement of cattle should be left in the hands of the Advisory Boards. He was against the fencing of large areas; let the Advisory Boards fence each outbreak at once, as soon as it appeared.

Mr. Blaker thought it was their duty not merely to consider the infected districts, but they should look also to the clean areas. It was the clean areas that they had to depend upon from which to stock the country in the future. He was very much astonished that such a request, as that which they had now to consider should ever have come before that Union. As soon as they began outspanning on the roads they were going to bring back the disease to areas which it had practically left. He thought, however, that those who had lost their cattle should be given some help, but at the same time he thought that anyone who should be found moving cattle outside of any particular zone should be severely punished. He asked how the Kafirs were going to be dealt with in the

locations? Had it not been for the fences the disease would long ago have swept through the country. Let them fight the disease to the last beast.

Mr. Fleming said he was amazed that the farmers of this Colony should be so shortsighted as to bring forward such a suggestion as that now before the Conference. It had been said that fences had been of no use. ("No!") He could not understand that attitude. Fencing had been found of great value in the Transvaal. He thought that dipping and fencing should go hand in hand. He was also very strongly in favour of branding, which was necessary to prevent the illicit movement of cattle.

Mr. Bester said that Mr. Scott had asked what were the facts. What really were the facts? They amounted to this: that if the restrictions were relaxed they would very soon not have a single animal left in the country. The only thing that appealed to him was dipping and fencing. In the Transvaal they had successfully fought East Coast Fever, and they were going to do it in Natal. It was of no use throwing up the sponge now.

Mr. Van Rooyen thought that the control of the movement of cattle should be left entirely in the hands of the local farmers.

Mr. Mitchell withdrew his amendment in order that consideration of Mr. Scott's motion might not be rendered difficult or confusing. He was certainly not in favour of Mr. Scott's suggestion—he was strongly against it—but he would withdraw his amendment in order that delegates might vote either for or against Mr. Scott's resolution, without any side-issues.

Mr. Hancock said that there was in the resolution brought forward by Mr. Scott a good deal for them to consider. It was not quite clear as to the extent or scope of this resolution, but the outstanding feature was this, whether at the present time the regulations should be in any way relaxed. He held that those regulations, instead of being relaxed, should be made more stringent. Mr. Scott had shown them that East Coast Fever was liable to be carried about as long as the disease exists. The only thing to be done, to his mind, was in isolated places to stamp it out altogether. At a meeting recently in the Transvaal there was a vote of thanks passed to the Transvaal Government for the efforts made to deal with East Coast Fever. Those regulations were very stringent. In the Cape Colony, again, the regulations which had been formed to deal with the disease were very stringent, and prompt action was being taken upon the appearance of the disease. He suggested stamping out, starting at the outskirts, and pressing the disease back by degrees. They had to deal with this question in the broadest possible spirit, and consider what was best for the whole Colony and not what was best for one or two districts.

only. This was not the time to think of any relaxation of the regulations: if anything, they should be made more stringent. If Mr. Scott's suggestion was carried into effect, they would have the disease with them ten years hence just as much as they had it now. (Hear, hear.) The regulations framed by the Advisory Commission ought to be adopted: were they adopted they would see the beginning of a new era. (Hear, hear.)

One delegate said that the Native was responsible to a great extent for the spread of the disease, carrying as he did ticks on his great coat as he travelled from district to district. He knew of one occasion when 200 ticks had been found on the great coat of a Native by a farmer. This being so, he argued, what was the use of restricting the movement of cattle? He also asked of what use were restrictions in districts through which the disease had passed?

Mr. Smallie, who represented the Hattingh Spruit Association, had received instructions to strongly oppose the present and the two following resolutions. He thought it was an extraordinary thing that, after fighting this disease as they had done, they should find gentlemen in this Colony willing to nullify the labours of the last three and a half years. The policy of the stoppage of movement of stock had been a **good** one, in spite of all that had been said to the contrary. There had been much adverse criticism of the Veterinary Department, but he held that the Department had been in a very peculiar position. They had not only had to fight a strange and unknown disease, but they had had to fight against antagonism on the part of the farming community. Had the farmers of the Colony done more to support the Veterinary Department the Colony would have been in a much better position at the present day. He said that the fundamental principles for the control of East Coast Fever advocated in the past by the Veterinary Department stood to-day just as well as they ever did. He did not blame the Veterinary Department but the Government for the slackness which had been apparent in adopting measures embodying their principles. Political considerations had been allowed by the Government to weigh too strongly. As regards the suggestion that the control of the movement of cattle be placed in the hands of the Advisory Boards, he considered that it was wrong and unfair to place such responsibility upon the Boards. He felt that undue influence would often be brought to bear upon members of these Boards with a view to securing desired concessions.

Mr. A. von Levetzow said that the members who had opposed the motion before the meeting had given no real reasons why they should vote against it. It was quite a reasonable proposition to leave the Advisory Boards to permit the movement of cattle where desirable—not necessarily all over the Colony, but only where local circumstances

warranted such a course. He moved the following amendment:—

“That this Union is of opinion that Government should withdraw all restrictions under East Coast Fever Acts and Regulations relative to the removal of cattle throughout the Colony, and respectfully urges that the Advisory Board in each East Coast Fever division be given full power to control all restrictions on the movement of cattle, and that steps be taken to give effect to this resolution.”

By leave of the meeting, Mr. Scott withdrew his resolution in favour of this amendment.

Mr. Marwick said he did not mind what regulations were enforced, or how stringent they might be, but he certainly considered that such regulations should be made effective in the case of white and black alike. He agreed with Mr. Smallie in his contention that the Government had not acted upon the advice of the Veterinary Department.

Mr. King said that, in spite of all the defence of the Veterinary Department which had been offered, there had been no constructive criticism. Nothing in the way of fresh suggestions for dealing with the disease had been offered; and, after all, all that remained to them was the resolution now before them. He spoke very strongly on the lax method of guarding the main line. He said that there had been no stint in the voting of money by Parliament for the purpose of dealing with the disease, but how had the money been spent? Proceeding, he said that the Government had at last had the wisdom to appoint an Advisory Commission, which had made certain recommendations. He strongly supported these recommendations, but what guarantee had they that these recommendations would be acted upon by the Government? (Hear, hear.) He said that the advice of the local Advisory Boards with regard to the movement of cattle had often been set aside by the Government, even when that advice had taken the form of the strengthening of the restrictions on the movement of cattle. He held that the Veterinary Department had not had a free hand in the matter of controlling of the disease, (Hear, hear.) He was going to support the resolution before the meeting. He had been in doubt, but after hearing all the arguments of the objectors who had spoken he found that the tendency was to let matters go on as hitherto, and this he certainly objected to.

Mr. B. B. Evans counselled the trial of the recommendations which had been made by the Advisory Commission. A new Government was about to come into office, and he thought they might wait and give this new Government a chance and see what they could do.

Mr. Mapstone said that if farmers paid more attention to tempering and isolating doubtful cases their losses from the disease would be far less. This had been his own experience. They must get at the root

of the disease—the tick, which could be overcome to a great extent by means of dipping.

Mr. Kirkman advised leaving the whole matter alone until Union took place: let them leave the matter in the hands of the new Government, and go into Union without a division on such a subject as that which they were now considering.

Mr. Dick was opposed to the resolution. He considered that it would be dangerous to give the Advisory Boards the powers suggested. It was rare that there was unanimity of opinion among the members of Advisory Boards. He thought they should leave the question of dealing with the disease in the hands of the new Government, who would, he felt sure, in the interests of the other provinces, spend money and do their best to eradicate the disease in Natal. Further, he thought it was unfair to those who had clean herds to allow the free movement of cattle as suggested. Further, he did not think laymen were competent to deal with the disease; for himself he was on the side of the professional man. He hoped the resolution would be thrown out.

Mr. Marwick thought that the fault in the past lay in the fact that there had been too many changes of regulations. Certain regulations should be drawn up and adhered to. He felt certain that it would be futile to pass the resolution, as the Government would be sure to disregard it.

Mr. Wiltshire said that if they relaxed the regulations they would be making a very serious mistake, in their own interests. (Hear, hear.)

Mr. Colenbrander thought that if the resolution were passed the effect would be that the Colony would revert to the position of two years ago.

The President at this stage said he thought the subject had had a good chance for a thorough ventilation, and that the matter might now be put to the vote.

This was agreed to, and the mover of the original resolution (Rev. Mr. Scott) then replied to objections.

Mr. Hosking's amendment was declared carried by 30 votes to 23. The amendment was as follows:—

“That this Union is of opinion that the present is not the time to alter the existing East Coast Fever regulations, especially as we are so near the coming Union of the Colonies.”

The President, in reply to a question, said he would very much like to have the report of the E.C.F. Advisory Commission fully discussed and its conclusions adopted by the Conference. He accordingly asked permission to bring up the matter for discussion.

Permission was granted, and the discussion was postponed until there was a larger attendance.

CLOSING OF CAPE BORDER.

Mr. C. H. Mitchell moved, on behalf of the Lower Umzimkulu Agricultural Association:—

“That this Union would urge upon Government to immediately arrange with the Government of the Cape to open the ports of entry to East Griqualand and Pondoland for all traffic other than cattle, the present restrictions being both futile and disastrous to the welfare of the southern parts of Natal.”

He explained that the measures which the Cape Government had adopted to stop traffic between Natal and East Griqualand were futile because people could easily get in by making a detour of a couple of hundred miles. There were dozens of Natives going backwards and forwards every day. He considered it was merely a “trade dodge” on the part of the Cape Authorities in order to divert trade from East Griqualand—especially in mealies from Durban to the Cape ports. The position was a very serious one for the southern parts of Natal.

Col. Rethman, in seconding, said that the people in East Griqualand were absolutely imprisoned, being unable to send their produce to Maritzburg.

Mr. Lund thought the Cape Authorities were quite justified in adopting drastic measures for the control of the disease. He would oppose the resolution.

Mr. Marriott spoke to the same effect.

Mr. Lund said they would be treading upon dangerous ground in passing such a resolution as this. At the same time some relief was evidently needed, and he suggested that the matter be left in the hands of the Executive to endeavour to obtain relief.

Rev. Mr. Scott moved the following amendment:—

“That whilst this Union sympathises with the peculiar position of the farmers in Alfred County, yet it cannot interfere with the Cape quarantine regulations.”

Mr. Hosking moved that the Lower Umzimkulu Association should be advised to petition the Cape Authorities. (Dissent.)

Mr. Scott’s amendment was carried.

PURCHASE OF HIDES.

Mr. Rancken, representing the Weenen Agricultural Society, moved:

“That this Conference is of opinion that the indiscriminate purchasing and carrying about of hides by Asiatics and Natives should be stopped.”

He considered that there was not sufficient discretion exercised in the granting of permits for the removal of hides.

Mr. Hancock said that no permit was necessary for the purchase of hides; a permit was required merely for the removal of hides from the district provided they were disinfected, but he held this disinfection was not properly carried out. (Hear, hear.) He thought the control of the purchase of hides should be placed in the hands of the Veterinary Department.

Mr. King asked if any of those who had spoken had ever seen a live tick on a dead hide? The real danger lay in the actual movement of the purchasers themselves about the country. (Hear, hear.)

Mr. Walton said there was a real danger in the carrying of hides, as they had no guarantee that the hides were not green.

Mr. Oldacre moved as an amendment:—

“That the control of the issue of permits for the removal of hides be placed in the hands of the Advisory Boards.”

Mr. Comrie thought that a regulation should be put into effect prohibiting the removal of any hides from a farm without the owner's authority.

The amendment was carried.

PUBLICATION OF OUTBREAKS.

Mr. Dick moved on behalf of the Royal Agricultural Society:—

“That the Government continue to publish, as formerly, in the newspapers of the Colony, a record of all outbreaks of East Coast Fever.”

Mr. Bazley seconded.

Mr. Dick moved the following amendment:—

“That the Government be asked to continue to publish, as formerly, in the newspapers of the Colony a record of all outbreaks of East Coast Fever; and also to publish from time to time a list of such areas and farms which may be regarded as having become clean. That each Magistracy be supplied with a map of the Colony showing the progress of the disease throughout the Colony and that statistics as far as possible be published in the *Agricultural Journal*.”

This amendment was carried.

(To be continued.)

One asset of pig-keeping should not be overlooked. Pig manure is exceptionally rich, and after what is turned into pork there is a residue which can be used to the greatest profit on the farm.

The Living Bee.

By MARY RITCHIE,

President, Natal Bee-Keepers' Association; Natal Expert, South African Bee-Keepers' Association.

(Continued from Page 389.)

XXII.—HARVEST TIME.

THE summer is passing. The skies are clearer and bluer than they have been for many days, and the thin streamer clouds, like tufts of thistle-down, are a sign that the cooler weather is coming at last. In the garden the chrysanthemums are in bloom, over roof and verandah the flowers of *Bignonia venusta* fall in "a golden shower," and by the roadside gay clumps of *Leonotis leonurus* in tall, taller spikes, with tier above tier of orange velvet flowers, gladden the passer by. Wine for the birds the Kafirs call it as they watch the little honeysucker draining the nectar, but some years—just as is the case with the salvia—the deep-throated blossoms open to the bees. Honey is scarce now except where the aloes are in flower. On these the bees work with a fine intensity, knowing that when the days are shortening it will be winter soon. Both for bees and bee-keepers the work is the work of harvest time.

All extracted honey should be bottled at once and tightly sealed, otherwise much of the aroma is lost. "What is aroma?" he asked her. "Aroma," replied the expert, is "the essence of flowers," but I doubt if the mere man was any the wiser! It is obvious at any rate that anything so subtle would be easily lost if exposed to the atmosphere, and on this account all honey, and especially show honey, should be bottled straight from the extractor.

A little ammonia in the water will put a shine on the bottles; and



they should be inverted and dried in the sun. I lost a prize once on account of my bottles. The judge said the honey was the best but the bottles were the worst. Even the babies asked, "Was the prize for glass?" All the same the prize was lost. Be careful then to purchase only clean glass and shine in the sun.

Attractive labels should be used. These, says a writer in "Gleanings," are easiest fixed by making a few hundred into a pack by gumming round the edges. Lay face down and paste the uppermost. The bottle is laid on the label instead of the label on the bottle. It is quite the quickest way.

Now comes the packing. Here a "cast-iron back with a hinge in it" is invaluable. Wrap each bottle separately to keep it clean and use abundance of packing. Given a hammer and nails, any Kafir boy will neglect his legitimate work—even his "scoff"—to knock them in, but watch him. Packing is tiresome work and might be left to someone else, for there are no stings attached, but it is the casting-off, and everybody—excuse the mixed metaphor—likes to be in at the finish.

Then there are the sections. Only a bee-keeper knows the joy of handling finished sections. Trimming sections is the high art of bee-keeping as well as crossing-sweeping, and some never attain to the higher reaches. "Oor Jock," explained the professional, "is a' right at a level crossing, but no a grain of use at a bit o' fancy work round a lamp-post!" Again, there are sections and sections, just as there are cauliflowers and cauliflowers. "That a cauliflower!" I heard the gardener exclaim, "How could you buy it, I would be ashamed to grow that, and if I did, I would be more ashamed to sell it." This should be the attitude of every worker, only the best must see the market.

If this is true of section honey it is even truer of extracted. And because I think the following words are seasonable and the subject important I quote them here. The article appeared in "Bee Gleanings," June, 1904. "All the surplus honey of 1902 came in in nine days, and in 1904, in about ten days. Now, if quantity had been my aim," says the writer, "I should certainly have set the extractor in motion, but as quality is my motto first, last and all the time, this honey was left on the hives until the autumn. I hope no one will think I saved labour by leaving my honey in their hives in this way. I went through all sorts of trials and tribulations, uncapping combs of thick, waxy honey, cross bees and robbers always on the alert; but my main object was attained. I secured honey of the highest quality. Had I set the extractor in motion during this rapid flow I could have increased my yield in bulk and pounds. By extracting late, I estimated a shrinkage, principally by evaporation, of at least one-third. All agree that if comb honey is put upon the market properly there will never be any trouble selling it. But do you know

that this big world has never seen the time when there was enough *fine fancy* liquid honey? Do you know there are some bee-keepers scattered all through the country putting honey on the market that is just as far from the real thing as soup made from a rooster's shadow is from the *real* thing. There are many wrong ways and only one right way of doing almost anything. If individuals or associations are to be successful they must be in earnest and look after *quality* in liquid honey. I have educated the people in this section of the country until I consider the disposal of four thousand lbs., a very small matter."

The honey packed and sent off. We are allowed a minute's breathing space, and that when the year is at its best—perfect autumn days and days of dream.

XXIII.—AUTUMN SWARMS.



Swarming is already reported from the Midlands, and beginners should be on the look out for swarms. Bee-keepers often wonder why bees should swarm at this time of the year. One can understand them leaving, amid the rise of sap, the rush and energy of new life that comes in the spring; one can imagine them leaving amid the heat and pressure of the summer, but that they should leave when days are shortening and nights are cold seems at first sight inexplicable enough.

Why should bees swarm in the autumn? Because it is autumn. Biologists tell us life is rhythmic and punctuated by the seasons. Swarming is an internal response to an external rhythm too strong to be disobeyed.

Autumn, though a time of withering and of dying, of burnt grass and falling leaves, is also a time of great abundance of life, of ripened fruits and scattered seeds. It is true the petals have fallen and the carpels withered, but enclosed in the heart of the plant are the living seeds, and on every side, in the very midst of decay and death, we are

reminded of the largeness, the bountifulness of Nature. In the same way, though a time of rest, of preparation for the winter, of gleaned fields and gathered harvests, it is strange to say the time of greatest restlessness. Here some strange primeval instinct makes the whole world kin, and we see that life in all its forms is one. The birds migrate, the lemmings rush to the sea, the bees swarm though there is snow on the Berg, the seals feel it and so do the salmon, even caged birds beat their wings against restraining bars, and humans exclaim, "There is an autumn feeling in the air—it's time to trek." (Holiday now are fixed for the summer, but in simpler days it was the autumn, and classes were not resumed till after harvest!) The bees then are no exception, for them to live is rhythmic punctuated by periods of rest and of work of repair and of waste, of struggle and of love. Love which in its biological sense means sacrifice; for the young come into their inheritance and the old rejuvenesce.

XXIV.—PREPARATIONS FOR WINTER.

The first autumn day (about the end of April on the Coast) we are arrested in the vicinity of the hives by the most pitiful groans. The drones have been expelled. Again and again of late the workers have taken them by the shoulders and run them out, but as persistently they have returned. To-night a watch is set; relentless sentries guard the entrance. They plead in vain. Nature has reduced their income; the bees must consequently reduce their expenditure.

The patience of the bees, says Mæterlinck, is not equal to that of man. One morning the long expected word of command goes through the hive; and the peaceful workers turn into judges and executioners. Whence this word issues we know not; it would seem to emanate suddenly from the cold, deliberate indignation of the workers; and no sooner has it been uttered than every heart throbs with it, inspired with the genius of the unanimous republic. One part of the people renounce their foraging duties to devote themselves to the work of justice. The great idle drones asleep in unconscious groups on the melliferous walls, are rudely torn from their slumbers by an army of wrathful virgins. They wake, in pious wonder; they cannot believe their eyes; and their astonishment struggles through their sloth as a moonbeam through marshy water. They stare amazedly round them, convinced that they must be victims of some mistake; and the mother-idea of their life being first to assert itself in their dull brain, they take a step towards the vats of honey to seek comfort there. But, ended for them are the days of May honey, the wine-flower of lime trees and fragrant ambrosia of thyme and sage, marjoram and white clover. Where the path once lay open to the kindly

abundant reservoirs, that so invitingly offered their waxen and sugary mouths, there stands now a burning bush all alive with poisonous bristling stings. The atmosphere of the city is changed; in lieu of the friendly perfume of honey the acid odour of poison prevails; thousands of tiny drops glisten at the end of the stings, and diffuse rancour and hatred.

And in a brief space, their appearance becomes so deplorable, that pity, never far from justice in the depths of our hearts, quickly returns, and would seek forgiveness, though vainly, of the stern workers who recognise only Nature's harsh and profound laws.

(To be continued)

Tree Planting.

By T. R. SIM.

(A Lecture delivered at the Conference of the Natal Agricultural Union, 1910.)

ANYONE on visiting the Maritzburg Railway Station can see at any time truck-loads of imported sawn timber passing up the railway to the country beyond—a sure sign that we are not yet supplying our own requirements, and that we are allowing some one else to get the benefit of the sawing as well as of the timber itself.

Those who know South Africa best realise how little is being done to change this to our own benefit, and yet how simple it is to do so. South Africa imports roughly £1,500,000 value of timber per annum, of which £250,000 is Australian hardwood, and £1,250,000 deals and other soft pine timber. We buy that while our own forests stand unused, because it is conveniently delivered in form ready for use; in fact, because somebody else has found it pays him to do our work for us, while we do not find it pays us to handle our own—we are too well off.

But let us consider how the future is going to affect that. There is not a civilised country in the world which is not using more timber per annum than the annual increase of the timber in that country's forests; that is to say, they are either using more and consequently depleting their stock, or they are using and exporting more with the same effect,

or they are, like Germany, using from their own stock only the annual increment, but they are also importing what balance they require. The natural consequence is that before long the world's timber supply will run short, especially of soft woods—and then where are we?

That this is not raising the price of timber more rapidly than it is doing is due to the fact that in the United States, in Canada, and in North Europe, the opening of a railway a few miles further inland taps a fresh spot, the lumberers make their living as before and there is only the few more miles freight to pay. But one day this will come to a dead end—no more spots to tap, and no sufficient re-growth to go back upon. Then, again, I say, where are we? In America and even in Europe there are numerous so-called forest areas which are mere skeletons. The good timber is cut out, but the useless old trees give it a semblance to good forest. Meantime some of the timber coming here travels 500 miles by rail and 6,000 miles by sea before it reaches our port.

The next move is to open up the virgin forests of the tropics, in which work I have been pioneering to some extent during the past few years, on the lower Zambesi and country beyond, but as happens in almost all tropical forests, the timber is almost hardwood, and consists of many kinds, so that it would be difficult for a mill there to send out shiploads of any one kind, as happens meantime with all large lumber mills in Europe and America. Taking the whole of the tropical forests, they would not for a long period supply the general demand elsewhere if it were dependent on them alone.

Then comes the crisis. Such countries as have been preparing for it will be more or less self-supporting; all others will be hopelessly stranded.

Now, what is the preparation going on? Germany and France have long worked their Government forests, so that the increment equals the felling, and to some extent further planting proceeds. Several other European countries and Japan work towards this. India and Cape Colony have forest services planting and protecting as fluctuating funds permit, but for the rest little can be said. In no case is there provision for supplying more than the country's own requirement. Even America, with all its up-to-date administrative machinery, burns ten acres for every one it plants; Canada plants mostly for farm protection; while it is stated that "ten times the amount of forest wealth has been destroyed in Canada through forest fires than has been cut by the lumbermen"; while Britain, paying £26,000,000 per annum for timber, and with any amount of suitable waste land available, has only lately begun a tree-planting scheme, at heart more a vote-catching expedient, and a provision for the unemployed and unemployable, than a genuine outlook for the

future, in which respect its methods does not contain even the elements of success. It is evident that in the near future South Africa will have to depend on South Africa alone for its timber supply. Now, what is the position? South Africa has less than one per cent. of its area under natural forest, and an insignificant proportion under plantations. Compare this with Europe, where almost one-third of its whole area is forest, distributed as follows:—Sweden, 48 per cent.; Russia in Europe, 38 per cent.; Servia, 32 per cent.; Austria, 30 per cent.; Germany, 26 per cent.; Norway, 24 per cent.; Belgium, 18 per cent.; Bulgaria, 18 per cent.; France, 16 per cent.; Great Britain, 4 per cent.; Portugal, 3 per cent., etc., and still Europe as a whole has to import $2\frac{1}{2}$ million tons of timber per annum in excess of her exports.

Germany alone, with 35 million acres of forests, and employing one-tenth of her population on forest work and timber manufacture, still imports $4\frac{1}{2}$ million tons of timber per annum, and the import has been increasing regularly and rapidly ever since transport allowed it, 60 or 70 years ago. All this shows that the proportion in South Africa is desperately small, and though the population is also comparatively small, the timber possibility from present sources is only an insignificant fraction of the requirement.

I have dealt so far with South Africa rather than Natal because, under Union, all must be considered together, but now comes a difference. Much of South Africa can never grow timber. The Cape Karoo, the flat plains of the south and west Orange River Colony, and much of the Western Transvaal, can never, under any circumstances, produce commercial timber profitably, and it remains, therefore, for Natal, where timber grows so easily, to make up this deficiency. Even though each Colony do all it can, there is no probability of overdoing the supply. I speak now more particularly of softwoods for building construction and other such purposes, deals, planking, pine beams matchwood, etc., which forms by far the larger portion of the imports.

The question naturally arises: Can we grow the kinds which are imported? In most cases, certainly not; or at least, not with advantage. They are slow-growing kinds used to a cold, wet winter and a fair rainfall all the year round, which conditions we cannot give. But we can grow others which answer the same purposes equally well, and which, when the timber famine comes, of which I have spoken, or even at the present time, we will be very pleased indeed to have.

These we can grow, and have grown experimentally for years, and have proved all that is claimed for them. We can definitely grow in Natal the softwoods required for building and similar purposes, and also

the hardwoods for whatever purpose required, and in this, as in mealies and butter and fruit and many other products it is only a matter of going about it systematically and persistently and patiently to ensure success.

It is no use saying that any one softwood is the best for the Colony, because conditions differ, and the suitable kind differs with the condition. But fortunately we have a considerable choice, and so can meet most cases. It is, however, in regard to all softwoods preferable to give a south, south-east or south-west aspect, if possible, as these almost always enjoy most rain and deepest soil, and usually are coolest and best protected. Still, it does not follow that trees will not grow to perfection facing the sun; often they do, growing to perfection more rapidly there than elsewhere, though, of course, the risk is greater. It is also necessary, for the production of commercial timber, to plant in forestal fashion—i.e., close enough to prevent the production of large side branches, each of which means a knot and a flaw in the timber, with correspondingly reduced value. On this account it is not reasonable to grow a line or two of trees and expect them to turn out clean timber except by pruning away the branches as these are produced, which again destroys the shelter value. Shelter belts, however, with abundant branches, give very good firewood and material for rough farm use. Or, a belt of considerable width, say, 100 yards, may be grown in dense condition, giving clean timber and still giving shelter, and if two such belts cross one another at or near right angles, shelter is produced from every wind, and if the centre is open a beautifully protected kraal is produced. Or, on the other hand, a square block set down anywhere in a field gives shelter the side be hollow instead of straight.

All such shelter planting, however, and indeed all planting of every kind, requires fencing, for it is absolutely useless to plant and then allow stock to destroy the trees. It is also necessary, in every case, to protect against fire, and to protect efficiently, for the Cedara fire showed that climatic emergencies have to be well provided against as well as simple fire, and that parsimony can be carried too far. A plantation should never be in a condition to burn on the ground from weeds, but with soft woods it usually does happen that if fire once gets in, it runs along among the branches without touching the ground, or if there be a good mulch of fallen leaves or dry humus, these may burn and carry the fire on, hence the need for special outside protection.

But, to revert again to which softwood kinds are most suitable, and speaking from present experience, I have no hesitation in giving equal first place to the two kinds, *Pinus pinaster* and *Pinus insignis*. Under usual circumstances *insignis* makes as much timber in 20 years as

pinaster does in 40 years, and the timber of both species answer all ordinary technical purposes if properly grown. On the other hand, *pinaster* is sure in most localities, even facing north, though better on other aspects, and stands in many places unsuitable for *insignis*, while *insignis* has an unfortunate knack of dying at an early age in many places. This, as I have frequently explained before, is its nature, not local effect. In its Californian home the same thing happens, 20 to 40 years is its full age, though occasionally a tree, or a clump of trees, stands out longer. Here that characteristic is maintained, though doubtless it is influenced at times by the climate, and we also notice that trees on shallow soil facing north may die from 15 years of age onward, while trees on deeper soil facing south seldom die till 25 or more years of age, and during that time they make as much timber as any other kind does in about twice the time. Consequently, in localities exactly suited for *insignis* that kind produces two crops in the time any other kind produces one, of the same value per crop. But in any locality suitable for pines, but not suitable for *insignis*, *P. pinaster* is the best kind to use, and in the upper districts it is the best in any case.

Of course, there are other pines, *P. halepensis*, *P. Canariensis*, *P. palustris*, and possibly *P. longifolia*, each of which may find a place here, though requiring more selection of site. Then for the coast and lower midland districts the various *Arancaries* are all worth growing for timber, when the plants can be had cheap enough—the timber is a good, useful softwood, when not too knotty.

For the higher districts *Cryptomeria Japonica*, *Cedrus deodara*, and *Callitris calcarita*, have the same qualifications—of course on selected sites while in the midlands, *Taxodium distichum* is a splendid tree for sheltered swamps which are not stagnant. Other softwoods might be mentioned, but the selection given is enough.

Turning now from softwoods to hardwoods, the Eucalypts, of course, claim first place, but here, as among the softwoods, it is just as difficult to place any one species as being decidedly the best. Kinds differ with locality and conditions, and they differ much in respect to the uses for which they are wanted. At the present time the main demand is for Transvaal mining timber, for which purpose no difference in price is given between the different kinds of gums, so long as the timber is straight and unsplit, consequently rapidity of growth to fit size counts largely. For such rapid growth no species exceeds, and probably none equals, blue gum (*E. globulus*), which, grown closely, gives a straight, suitable timber for props as any other kind, though when grown sparsely or in belts it branches too much, and twists and sometimes bends. Its

next competitor is *E. viminalis*, nearly equal in growth, more hardy, and quite suitable for the upper districts wherever there is soil enough. Neither of these two have high qualities beyond rapid growth, at least not until they are quite mature. But those who look a little into the future, find that that kinds which can be used for technical purposes are also worth growing, even though they do not grow so fast.

In Australia various gums are used for all kinds of purposes, standing in the ground as posts, or in water as piles; also for beams, house-building, mine-framing, wagon and carriage making, railway sleepers, furniture manufacture, and numerous other uses.

Many of these gum timbers are imported into South Africa yearly, under names which hide the fact that they are gums, such as Karri, Jarrah, Ironbark, Grey-box, Swamp Mahogany, Red Mahogany, Spotted Gum, etc., the total import of such gums being about £250,000 per annum. Australia is felling destructively, glad to get the ground to pay its way when being cleared for cultivation, and though the supply at present appears to them inexhaustible, one looking on with a knowledge of what has happened elsewhere, can easily see that the end is nearer than appears to the man on the spot, whose main interest, in any case, is present returns.

Now of the gums Australia produces, only one has definitely refused to do any good in South Africa, and that is the Jarrah, which, coming from the south-west corner, enjoys there winter rains which we cannot supply. There is a long list of gums—some useful and some useless, each having its own value and locality and requirements, so varied that I cannot enter on them to-night, but I will be pleased to advise any one at any time in respect to these.

Then we have Blackwood (*Acacia melanoxylon*), a grand furniture-timber, used in Australia for panels, piano framing, etc., but here only wanted yet for mining props. Still when Maritzburg has all its new industries going, including piano making, furniture making, railway carriage shops, etc., it will find its proper demand in these industries as well as for carriage panels, railway carriage construction, etc., etc., and the farmers' part now is to grow the trees to be ready then.

Another beautiful timber of a softer class is *Grevillea robusta*, the carriage panels of which, shown by Ford Bros., and the furniture, shown by Reid, at the last Royal Show, excited intense interest: and still, when these manufacturers want more 12-inch material, they have to send to Australia for it, not because it does not easily grow to that size here, but because most of the local trees are too young to have reached that size.

! We have also the various *Cupressus* and *Juniperus* kinds, which make

beautiful and useful half-hard timber, but have never been grown here in plantation order, and consequently are always branched too much for timber; these, however, suit from the Berg to the sea.

Then there is the *Cedrela*, the teak from which most of the importer cigar boxes are made, suitable wherever there is little frost. *Casuarina*, suitable for even the coast sand dunes, though also doing well up to the Berg, and yielding useful poles and valuable timber, and the oak, which, though not suitable everywhere, has its place in our economy.

These are only a few of the trees which suit Natal, and have value, but enough to show that we have choice to work upon.

You may have noticed that my list includes few of the British or North American kinds; the reason is all these require a wet winter and spring, and are practically commercial failures where they cannot have that.

I have made no reference either to wattle, which is in a different category, and has its separate treatment and uses from these; it may be quite the case that where wattle is at its best, it is more profitable than most timber trees, but it is also the case that even on wattle farms there are many localities not suited for wattles, but which may be beneficially occupied by other trees, especially poplar, which meantime imported in quantity for match manufacture, may be grown to advantage in many a vlei almost to wet for anything else.

I have shown that South Africa is to be in a bad plight when foreign supplies run out, and that numerous kinds meeting all classes of locality and demand can be grown here, and I would now like to indicate what action could be taken.

In the other South African Colonies, the Government action, though influenced by the state of the purse, has so far been consistent, working toward an increased, but as yet totally inadequate supply; poor Natal has proved too barometric, making a spurt in 1889, and another in 1902 on my arrival, only to lapse again into its present condition.

The effect of Union remains to be seen, but meantime the private planter has his chance, first planted, first reaped.

In my report of 1902, after detailing the timber imports through Durban, and stating the increment shown by experience, I wrote "then to meet the total import a fully stocked standing area of 35,000 acres would be required, or on a 35 years rotation the afforestation of 1,000 acres per annum for the first 35 years, and the felling, and reproduction, either naturally or artificially, of an equal area per annum afterwards. More rapid planting would, however, be a decided advantage at first to allow an accumulation for emergencies, or increased demand, especially

as the stock continues to increase in value with age for many years, and the European population is expected to increase rapidly."

To these figures I still adhere, only with this difference, that we are now linked up with Bloemtontein, Kimberley, and the North, and as our area of distribution is largely increased, so is our requirement, besides which the demand for the mines has increased enormously. Taking then 2,000 acres a year as the reasonable amount planted in Natal regularly in the future, I am afraid that even under Union we have no reason at all to hope that this will be worked up to, even in any one year, by the Government.

Forestry is, in older and colder countries, rightly looked upon as a Government concern rather than an individual interest, on account of being too long-winded. But here, where trees grow with a rapidity unknown in Northern Europe or America, and come into marketable condition in a comparatively few years, another aspect is thrown on the question.

There are those to-day in Natal who are obtaining about £50 per acre for gum trees as they stand, 20 years old or thereby, on an expenditure of what would not be about £5 per acre, or a profit of, say, £2 5s. per annum for the whole period, and, considering how little is the initial cost, how little is the trouble required afterwards, and how sure is the result, I ask, is this not as well worth investing in as anything else that is going? Others are making more or less than this, in accordance with locality and age, the further up-country the more is the profit, and the present demand is rather for trees 6 to 8 years old than older.

With pine the result is even better if properly located.

To stir up some enthusiasm in this direction, Mr. Orlando Hosking last year brought before your Conference a motion that a series of prizes be awarded to the most successful tree-planting competitors under certain conditions. Not disconcerted by the fact that your Union did not have funds available, he pegged away and got several members to guarantee the amount required; the competition was duly advertised, and now your secretary informs me that 31 five-acre plots have been entered for competition by 18 competitors, and vouched for as planted.

That, gentlemen, means 155 acres planted by this simple expedient, and planted, too, in various parts of the Colony, so that if ever a fire does get hold of one it will not clear the lot, as happened at Cedara. But if there be one thing more than another which the committee desire to impress in connection with this competition, it is that every competition area shall be an object lesson in its district, cultivated and attended to as a sample of the grower's idea of what should be, not of what circumstances and accident produce. Also, that the object is to

produce timber, fit not only for mining timber, but also for the more highly technical classes of work, rather than mere shelter, rough stuff, and firewood.

I have to thank the planting public for the confidence they have shown in myself in this matter, for of the 18 competitors, 14 obtained practically all their trees from my own establishment, other two obtained about half from me, and raised the rest themselves, while two raised their whole quantity themselves. Someone says I may very well encourage tree-planting when I am making something out of it in that way, but I assure you that I feel my responsibility toward the Colony greater now than I did even when Conservator of Forests, for each of these is a living testimony either for or against me.

But, to return to my subject, the committee have been at it again, and have succeeded in obtaining and investing funds sufficient to ensure a similar competition yearly for the next few years, while I understand they also see their way to do something of the same kind in regard to fruit trees.

I feel quite sure that those who have planted will do so again, and that others, seeing their success, will join the ranks.

I do not, however, urge tree-planting simply because prizes are offered; that is a good inducement, but the thing is good enough in itself, and not nearly so slow in giving returns as is generally supposed.

Now, let farmers bank against future cattle disease or other ills by tree-planting, and whether as competitors or not, plant up the 2,000 acres per annum, which is Natal's necessary quota, and if advice from me is likely to be of any use to anyone at any time, he is freely welcome to it.

DISCUSSION ON THE LECTURE.

The conclusion of the lecture was greeted with loud applause.

A discussion followed on the characteristics of certain of the trees mentioned in the lecture, and as methods of planting, Mr. Sim giving the planting distance for most of the branching trees as eight feet.

A delegate asked what trees would be suitable for ceiling boards.

Mr. Sim replied that either *Pinus pinaster* or *P. insignis* were suitable.

In reply to further questions, he added that for wagon naves the best trees were blackwood and yellow-wood; and for sleepers the Karri and the various iron-barks (including the Torrville gum). He also said that gums grown in this country would be as satisfactory for sleeper purposes as the imported woods, provided they were allowed to attain the

same growth. The growing of yellow-wood was not recommended as a commercial proposition. *Pinus pinaster* would do as well as any imported pine for sleeper purposes, if creosoted in the same manner as was necessary in their case.

The *casuarina* was suitable for box-making, and it also made pretty furniture, though it was not strong enough to provide ideal beams or flooring.

In reply to the Chairman, Mr. Sim said the euclaypts grew, generally speaking, more rapidly here than in Australia, and in the right localities were capable of attaining similar development.

Replying to a delegate, Mr. Sim said there was a possibility of growing rubber trees on the coast, but not the slightest probability of making a penny out of them, especially as the price of rubber was likely to decline.

The Essenwood tree, Mr. Sim replied to another query, was very valuable for the fruit, from which a valuable oil could be obtained, and the timber was also good, and was well worth growing. The wood required to be soaked in water immediately after cutting, in order to prevent damage by insects.

Rev. Mr. Scott, in moving a hearty vote of thanks to the lecturer, said that the amount of interest aroused was proved by the large number of questions asked.

Hon. T. Hyslop seconded, and said the lecturer had drawn their attention to the sin we in this country had been committing in neglecting tree-planting as we had hitherto done.

A delegate suggested that the lecture should be printed in pamphlet form and placed on sale.

The Chairman said it would, perhaps, be possible to get a certain number of slips struck off. His advice to those present was to go home and plant, as he himself intended to do.

It was also suggested that the Editor of the *Natal Agricultural Journal* be requested to print the lecture in his pages.

In-breeding, lice, dampness, and improper food are the main causes of mortality amongst turkeys.

From the lowest mammal to the noblest man milk is the flesh-builder and giver of nerve power. It is one product that serves an indispensable purpose in the perpetuation of the human race. Let it, then, be pure and sweet at any cost.

Cape Fruit Export.

REVIEW OF THE 1909 SEASON.

IV.

THE following is the conclusion of the report by the Cape Government Trade Commissioner in London on the Cape fruit export trade (the first instalment of which appeared in our January issue):—

APPLES.

The quantity of apples exported from the Cape Colony is hardly worth mentioning, and is, I regret to say, apparently decreasing, as the following figures for 1908 and 1909 will show:—

Number of boxes exported, 1908	450
Number of boxes exported, 1909	201

I am at a loss to understand why the trade in this fruit has not made more progress in the Colony. The apple is one of those fruits which may be termed a “great article of commerce,” and the demand for it on the markets of the world is almost unlimited. If growers in the Colony can produce this fruit at a low cost they can rest assured that the markets of Europe will take all they can ship.

I was hoping to see the development of a large export trade in this fruit in the near future, and I still believe it to be possible.

During the year ending 30th June, 1909, the United Kingdom imported nearly three million cwt. of apples. A cwt. is equal to about three bushels, and a bushel of apples is worth about 7s. to 10s.

The following were the chief exporting countries:—

	Cwts.
Canada	1,270,891
United States of America	761,391
France	294,499
Belgium	270,034
Netherlands	53,694
Portugal	84,734
Germany	1,598
Tasmania	182,486
Victoria	50,214
South Australia	14,756
New South Wales	1,248
West Australia	53
Cape of Good Hope	49
New Zealand	22

To deal with the whole question of the apple trade in this report would be quite impossible. Volumes have already been written on the cultivation of the apple, the different features of the various varieties and their suitability for different climates, their seasons, diseases and the methods of their extermination, and on the packing, grading, transportation and marketing of this fruit. I need, therefore, only deal briefly with a few of these subjects.

Varieties.—On a former occasion I made inquiries from several large dealers on these markets as to the varieties which make the best price. I found that they were by no means unanimous in their opinion, but the following varieties were most favoured:—

Dessert.—Cox's Orange Pippin, Ribstone's Pippin, King of the Pippins (Adams Pearmain), Sturmer Pippin, New York Pippin (Cleopatra), Newton Pippin (Oregon), Blenheim Orange, Jonathan, Russet Baldwin.

Cooking.—French Crab, Rhodes Island, Greening, Wellington.

It must be clearly understood that I only mention these varieties because they find most favour on the market here. Different countries favour different varieties, because they have learnt by experience those which can be most easily produced and which travel best. It is only by actual experience that growers in the Cape Colony can attain to similar knowledge.

Seasons.—Apples are imported into England almost all the year round, but we need only concern ourselves with the prices and conditions of the market at the time when it is possible to ship apples from South Africa. American, and especially Californian, apples arrive on the European markets up to almost the end of March, but during that month, in consequence of the lateness of their marketing season, these apples are much out of condition. The Australian, chiefly Tasmanian, apples commence to arrive about the first week in April.

The price obtained for fresh, well-packed apples is generally highest during March and up to the arrival of the Australian apples.

If I am correct in my assumption that Cape apples ripen about the same time as the Australian fruit, I contend that they should be able to compete on the market with Australian, since they have the advantage of at least 21 days start—that being the difference between the length of the respective sea voyages—and a slightly cheaper freight, *viz.*, 2s. per bushel box from the Cape, as against about 2s. 4d. from Australia. During these three weeks, Cape growers could ship about six shipments of 30,000 cases per vessel, or a total of 180,000 cases, without much upsetting the markets. After that we must compete on equal terms with the Australian fruit, but I see no reason why we could not do so, although the cost of packing is a point in their favour, as they have the advantage

of very cheap boxes made locally, whereas boxes for Cape fruit have to be imported. The figures I have quoted as possible Cape shipments are not excessive; the Australians think little of landing 100,000 bushels in one week.

Prices.—The prices vary much and depend on the variety, the condition of the fruit on arrival and the conditions of the market; but as a guide I think fair average prices would be from 6s. to 11s. per box of one bushel. I have estimated that the charges for packing material, labour, freight, dock and railway charges for this quantity of fruit would amount to from 4s. to 4s. 3d. per box. These figures do not, however, include the cost of the fruit.

Packing.—The best method of packing, as adopted by most countries, is in the standard size one bushel box, 10 in. deep by 11 in. wide by 20 in. long, the net weight of fruit contained therein being about 40 lbs. to 45 lbs. The use of small trays by Cape packers is costly and must be abandoned. The fruit, after having been carefully graded, should be wrapped in tissue paper, either plain or suitably printed, and then carefully and tightly packed in tiers with four to five apples in alternate rows, or five apples in every row in accordance with the size of the fruit. Very tight packing is most essential; no wood wool need be used excepting when necessary to tighten the packing. The packing and grading of apples is a fine art, which must be studied, and can only be learnt by experience. It cannot be adequately described in a brief report.

MELONS.

During the past season only about 216 cases of melons were shipped as compared with 1,494 cases during the previous year, the reason for this falling off being that during 1908 experiments were made in the shipment of several varieties, almost all of which proved to be bad travellers. There is at least one variety, however, which has proved to be quite a good traveller, and which generally arrived here in a very sound condition. This variety is called at the Cape the "Winter Melon," and is now known at Covent Garden as the "Spans-speck." It was first shipped by the Rev. S. J. du Toit, of the Paarl, and I have in my previous reports recommended growers to ship this variety only. It is round in shape, with a smooth, greenish-white skin, green flesh and has an excellent flavour. Unfortunately, however, its appearance is against it, and its real excellence is not known on these markets to buyers, who are accustomed to see a small oval or round yellow netted melon grown in a hot-house, which makes about 1s. to 2s. 6d. each wholesale. Buyers have, however, already become accustomed to the rather rough-looking Cantelope melon, which is an excellent red-flesh melon imported from Spain and France, making about 2s. 6d. to 4s. each wholesale, and I have every hope that in time the Cape Winter Melon will establish itself on these markets and that a profitable trade will result.

In consequence of the different sizes of melons it is rather difficult to suggest the best method of packing, but I may say that each melon should be wrapped in paper and packed tightly in boxes of convenient size with lots of wood wool. The size of the fruit should not be more than from six to eight inches in diameter, or about the size of an Edam cheese.

The question of the temperature most suitable for the transportation of the different varieties should be studied, and I recommend growers to take advantage of the cold storage experiments about to be carried out by the Government.

During the past season the following prices were made for Winter Melons when sound and of fair medium size:—

February	5s. to 6s. per doz.
March	10s. to 12s. per doz.
April	12s. to 13s. per doz.

SUNDRY FRUITS.

Grenadillas.—Small quantities of grenadillas have been received during the past few seasons from the Cape Colony; larger quantities arrived from Natal. These were packed in single-layer trays and made from 3s. to 7s. per tray. The variety of grenadilla grown in the Cape Colony and Natal, that is, the small brown, rather shrivelled variety, is not very acceptable to the English market as it is not known here. The variety better known is the large, yellow, smooth-skin fruit, which comes from the West Indies and other parts. I have on more than one occasion sent seeds of this latter variety to correspondents who communicated with me upon the subject, and I am looking forward with interest to the result.

Pomegranates.—During each season small quantities of pomegranates arrive from the Cape. This fruit, however, can only be sold in very small quantities. If they are large and showy they will be bought by fruiterers chiefly for decorating their shop windows, and for small quantities they will pay good prices, probably from 6s. to 12s. per box of 20. The Cape pomegranates are altogether a finer and more attractive fruit than those which arrive on these markets from elsewhere.

Quinces.—Small consignments of quinces have also come forward at different times. This fruit is comparatively unknown on these markets and only very small quantities can be sold. If they could become better known I think a fair market could be created for them as they are a good stewing fruit, besides which they might also probably be used by jam manufacturers; but in the latter case they must be shipped cheaply and in large quantities. With this object in view, experiments should be made by shipping small quantities packed in one bushel boxes in the ventilated hold of the ships.

Assistance to Farmers.

FENCING AND ERECTION OF DIPPING TANKS.

HOW LOANS MAY BE OBTAINED FROM GOVERNMENT.

THE Under Secretary for Agriculture (Mr. H. A. Hime) has issued a Government Notice, dated 26th April, drawing attention to the provisions of Act No. 20 of 1910, which empowers the Minister of Agriculture to make loans to owners of land, or to lessees or other occupiers of land, to assist them in the construction of dipping tanks for cattle and in the erection of fences *other than boundary fences* on their farms; and applications are invited from persons who desire to obtain a loan for either purposes. The Notice proceeds:—

A loan for the construction of a dipping tank will be limited to £100, and payment will not be made until the tank shall have been certified to have been satisfactorily completed and to be ready for use.

A loan for fencing purposes will take the form of a supply of material only, and in no case will a cash advance be made in respect of any such loan.

All loans will be repayable, together with interest thereon, at the rate of five per cent. per annum, by thirteen equal yearly instalments, the first of which will be payable two years after the date on which the loan is made or the fencing material is first supplied by the Government, and subsequent instalments will be payable at the end of each period of twelve months from the due date of the first instalment. Any borrower however, will be allowed to pay off his whole liability, with interest to date of payment, at any time if he should wish to do so.

It will be a condition of any loan to an owner of land that the unpaid instalments, with interest thereon, shall be payable by the owner for the time being of the land upon which the dipping tank is constructed, or the fencing erected, for which the loan is made, and in the case of a loan to a tenant, approved security for the proposed loan will be required; such security must take the form of a bond to be signed, in conjunction with the applicant, by two registered owners of land.

Applicants for loans should in every case furnish particulars as to the name of the farm on which the dipping tank is to be constructed, or

the fencing erected, as given in the title deed or other document, the name of the Magisterial Division in which it is situated, the grant number, the name of the registered owner, and any other particulars which will facilitate identification of the land, and in the case of an application for a loan for fencing purposes, particulars should also be given as to the length of the fencing which it is proposed to erect, the number of 14 lb. six-hole standards, droppers (to match the standards), coils of barbed and No. 8 and No. 12 galvanised binding wire, straining posts and gates (stating whether single or double, and the sizes) which will be required, and as to the name of the person to whom the materials should be consigned and the name of the railway station to which they should be sent.

Materials other than those specified above cannot be supplied.

Applicants for fencing loans will be required to arrange for the transport of the materials from the railway station to the farm at their own expense, and to also give an undertaking that the fencing will be erected without delay.

BOUNDARY FENCES.

The Minister of Agriculture is also prepared to supply fencing material, under Act No. 6 of 1907, to farmers who may desire to fence the boundaries of their farms, but it will be a condition of the supply of materials for boundary fences that applicants must state definitely that the whole cost of such materials, including cost of carriage and incidental expenses, shall be registered as a first charge and lien in favour of the Government upon their lands to be fenced, in terms of Section 4 of that Act, and applicants must agree to arrange, without cost to the Government, for the transport of the materials from the nearest railway station and for the erection of the fencing without any delay.

When applying for loans for fencing materials, applicants must state clearly whether the materials applied for are for the erection of boundary fences or of fences other than boundary fences, and in the case of materials being required for both purposes, separate application must be made.

The requirements of the Department being clearly set out in this notice, unnecessary correspondence and delay will be avoided by a strict adherence thereto.

PROVISIONS OF THE ACT.

For the convenience of our readers we reproduce herewith the main provisions of Act No. 20 of 1910, under which the foregoing notice has been issued and which authorises loans by Government for the construc-

tion of dipping tanks and the erection of fences and extends the provisions of the East Coast Fever Acts. The substance of the Act is as follows:—

1. The Minister of Agriculture may upon application make loans to owners of land, or to lessees or other occupiers of land, to assist them in constructing dipping tanks for cattle and in erecting fences within the boundaries of their farms. Any person other than an owner must furnish approved security for the proposed loan. The Minister may in place of making a loan for purposes of fencing, supply fencing material, and in such case the price charged by the Government for such material, together with all cost of carriage and incidental expenses, shall for the purposes of this Act be deemed to be a loan. An account certified by the Chief Accountant of the Department of Agriculture shall be sufficient evidence of the amount of such loan. The regulations under this Act may prescribe all details and procedure in connection with the granting of loans, but no loan for the construction of a dipping tank shall exceed £100, and payment will not be made until the tank is satisfactorily completed and ready for use. The word "owner" as used in this Act means a registered owner or the holder under certificate of sale or allotment of land bought from the Government.

2. All such loans shall be repaid, together with interest thereon at the rate of five per cent. per annum, by thirteen equal yearly instalments, the first payable two years after the date on which the loan is made or the fencing material is first supplied by Government, subsequent instalments being payable at the end of each period of twelve months from the due date of the first instalment. Nothing in this section shall, however, prevent a borrower from paying off his whole liability with interest to date at any time if he should wish to do so.

3. In the case of a loan to an owner the unpaid instalments, with interest, shall be payable by the owner for the time being of the land upon which the dipping tank was constructed, or the fencing erected, for which the loan was made. Every such owner shall accordingly be liable for the instalments and interest as they fall due in the same way as if the loan had been made to him, and he shall be entitled to recover any sums which he may have paid from the person to whom the loan was actually made unless such claim has been mutually adjusted in the price of the land or otherwise.

In the case of a loan to a tenant, he and his successors in the tenancy shall, together with the sureties, be liable for the instalments falling due during the tenancy and for the interest thereon, and any further instalments with the interest thereon shall be payable by the owner for the time being in accordance with the provisions of the first paragraph of this section.

4. (1) Section 6, and the reference thereto in Section 11, of Act No. 32, 1908, are hereby repealed.
- (2) The Minister, acting with the advice of the Advisory Commission established under this Act, may by notice in the *Government Gazette*, divide any Magisterial Division into two or more districts for the purposes of this section.
- (3) The Magistrate of any Division shall, upon receiving a requisition signed by not less than fifteen persons, being registered voters and owning cattle in the division, or in any such district as aforesaid, call a meeting of cattle-owners being registered voters of the Division or district, as the case may be, to consider the question of enforcing the dipping or cleansing of cattle.
- (4) Notice of the time and place appointed for the meeting shall be published four times in some newspaper or newspapers circulating in the Division, the first notice being published two weeks at least before the appointed time. The Magistrate or his deputy shall preside at the meeting. Any person being a registered voter and owning cattle within the Division or district, as the case may be, may attend and vote at the meeting. This meeting may be postponed to a convenient date if necessary on account of stress of weather or for any other reason which the Magistrate may consider proper. Notice of such a postponement of the meeting shall be published as aforesaid at least twice.
- (5) If the meeting be attended by not fewer than thirty persons entitled to vote (of which the Chairman shall decide), and a resolution be passed by the majority in favour of compulsory dipping or cleansing, the Magistrate shall report the same to the Minister, who shall thereupon issue an order making it compulsory for all cattle within the Division or district, as the case may be, to be dipped or cleansed in such manner and at such intervals as he may prescribe, and such order may be enforced by the several advisory committees within the Division or district, or by any persons whom the Minister may direct to execute such order.

If the meeting be not attended by the prescribed number of qualified persons, or if such resolution as aforesaid be not passed, the Magistrate shall not be again required to convoke a meeting within the next three months.

- (6) For the purposes of this section every municipal borough or township established under Law No. 11, 1881, or a like Act, shall be regarded as a district within the meaning of the preceding sub-sections, and the remainder of Magisterial Division in which such borough or township is situated shall be treated as if it were an entire Division.
- (7) In every borough or township in which a resolution has been passed, and an order made by the Minister as aforesaid, the Town Council or Local Board shall be required to construct and maintain so many good and sufficient dipping tanks for cattle as may in the opinion of the principal officer of the Veterinary Department be required for the dipping of cattle in such borough or township.

Should any Town Council or Local Board fail to construct the required number of tanks within a time to be notified by such officer after the issue of such order as aforesaid, or to maintain them ready and fit for use, the Minister shall be empowered to construct such tanks, or to repair or maintain them, and the expense incurred shall be recoverable from the Town Council or Local Board.

- (8) The Natal Native Trust shall in like manner be required to erect and maintain dipping tanks in any Native location or mission reserve whereof they are the trustees, situated within a Division or district in which a resolution has been passed and an order made as aforesaid.

5 The Governor in Council shall in the month of March in each year, or so soon thereafter as may be, appoint five persons having a practical knowledge of cattle farming, and not being in the Government employ, to be an Advisory Commission the function whereof shall be to offer advice to the Minister upon any subject connected with the administration of the East Coast Fever Acts and the suppression of the disease. The Commission may elect its own chairman.

6. Sub-section (a) of Section 1 of Act No. 32, 1908, is hereby repealed, and in place thereof is enacted the following sub-section:—

- (a) To require any person to erect one-half of such boundary fences on his farm or land as they direct, and to keep the same in good order and repair. The fences shall be of such a kind and standard as the committee may prescribe, but not of a more expensive character than those required by the Fencing Laws Nos. 30 and 36, 1887.

7. The Governor may from time to time make any regulations required for the purposes of this Act.

The Position of East Coast Fever.

OUTBREAKS DURING APRIL AND MAY.

THE Chief of the Veterinary Division (Mr. W. M. Power) furnishes the following list of outbreaks of East Coast Fever that have occurred during the period 22nd April to 19th May, 1910:—

Dundee Division.—Outbreaks on the farms “Coalfields,” east of main line, “Gladstone,” east of main line and north of Dundee-Vryheid.

Alexandra Division.—Outbreaks on the farms “Dingle,” “Mtabobovu,” “Location No. 1.”

Ladysmith Division.—Outbreaks on the farms “Putena Spruit,” west of main line, “Lot 86, Town Lands,” east of main line, “Twyulaar,” west of main line, “Daan’s Kraal,” east of main line, “Colworth,” west of main line, “Riverside” (sub-division of), “Klipfontein,” west of main line.

Krantzkop Division.—Outbreaks on the farms “Doornhoek,” “Spring Grove” (sub-division of “Varken’s Vlei”).

Lion’s River Division.—Outbreaks on the farms “Curry’s Post” (sub-division of “Thomasville”), east of main line, “Valhalla,” “Lynedock” (sub-division of “Wilde Als Spruit”), east of main line, “Esseldene” (sub-division of “Petrus Stroom”), west of main line, “Tweedie Hall,” west of main line, “Sherwood,” east of main line.

Camperdown Division.—Outbreaks on the farms “Stoke” (sub-division of “Lux”), “Strathfieldsaye,” “Lovo Dale,” “Philpot Place,” “Ismont,” “Emerald Hill.”

Richmond Division.—Outbreaks on the farms “Blackwood Grove” (sub-division of “Kruisfontein”), “Enon,” “Long,” “Willow Park,” “Richmond Commonage,” “Lincoln,” “Stackpool.”

Isopo Division.—Outbreaks on the farms “St. Michael’s,” “Hancock Granga,” “No. 2,” “C 5,” “East Wolds,” “Location No. 7,” “Weathercote,” “Location No. 8,” “Cromwell,” “F. P. 14,” “F F,” “S. 31,” “Mabehlana,” “Clifton,” “Rocky Glen,” “Stae Braes” (sub-division of “Waterfall”), “McKenzie,” “Springbrook,” “Fairfields,” “Nqodi.”

Estcourt Division.—Outbreaks on the farms “Gourton,” west of main line, “Vaai Plaats,” west of main line, “Koplaagte,” west of main line, “Erasmus Kraal,” east of main line, “Plessis Laager,” east of main line, “No. 7,” west of main line, “Compensation” (sub-division of “Vaai Plaats”) west of main line, “Klipfontein,” west of main line, “Deel Punt,” west of main line, “Retreat,” west of main line, “Vaakingsfontein,” west of main line, “Longwood.”

Bergville Division.—Outbreaks on the farms “Acton Holmes,” “Bethieny,” “Hongerspoort.”

Lower Umzimkulu Division.—Outbreaks on the farms “Olympas,” “Brasfort Flats,” “The Remains,” “Waterfall.”

Newcastle Division.—Outbreaks on the farms “Mooi Plaats,” west of main line, “Rooi Vaal,” west of main line.

New Hanover Division.—Outbreaks on the farms “Kopperbult,” “Welgelegen,” “Jammerdaal,” “Foxon.”

Umvoti Division.—Outbreaks on the farms “Craiglands,” “Menneheim,” “Redcliffe,” “Craigie Burn,” “Overvloed,” “Eland’s Dale” (sub-division of “Overvloed”), “Hartebestevlaakte,” “Sephiadale.”

Impendhle.—Outbreaks on the farms “Vancuse,” “Clarmont,” “Moru,” “Boschberg,” “Coquidale.”

Polela Division.—Outbreaks on the farms “Elmsel,” “Location No. 2.”

No record is kept of outbreaks in the following Magisterial Divisions:—The whole of the Province of Zululand, the whole of the Victoria County, Vryheid, Ngotshe, Babanango, Paulpietersburg, and Umsinga.

Science and the Farmer.

NOTES OF INTEREST BY FARMING EXPERTS.

A FACT, which is receiving much attention from biologists at the present time, is that a filter-bed does not reach its normal state of efficiency, or technically “become ripe,” until it has been in use five or six days; this is believed to be due to the formation on the surface of the sand of a gelatinous microbic tissue (soolglæa) produced by bacteria.—ALLAN GREENWELL, A.M.I.C.E., F.G.S., and W. T. CURRY, A.M.I.C.E., F.G.S. (“*Rural Water Supply*”).

IRRIGATION AND FROST.

The effect of irrigation is sometimes found to render both vines and trees subjected to it very susceptible to the frosts and severe weather of winter. This disadvantage seems to be a necessary adjunct, or set-off, to the advantages gained by the practice. Thus, a severe winter has been known to destroy whole groves of olive trees that have been irrigated, while scattered trees, not so cultivated, have escaped.—HENRY STEWART (“*Irrigation for the Farm, Garden, and Orchard*”).

AUTUMN PLOUGHING.

In South African practice the autumn ploughing of vlei soils to a steep, open furrow is to be recommended, and in the case of new lands should be followed by shallow cross-ploughing in the interval between the early and late spring rains. When brought into good tilth and heart, too much ploughing may do harm by exposing soil and fertilisers too freely to the air, and by tending to pulverise the earth too finely. The destruction of weeds in some cases will render a second ploughing obligatory.—E. R. SAWER, *Director of Div. of Agr. and Forestry, Natal Dept. of Agric* ("Cedara Memoirs," Vol. I.).

VALUE OF COWPEAS.

Perhaps no single agricultural crop is of greater economic importance to the people of the United States than cowpeas, yet its cultivation is comparatively recent in this country. Each year the crop is better appreciated, and its area is being rapidly extended. While the cowpea is not a true bean, it is a valuable forage crop and a great soil renovator. The seeds are valuable as grain, the hay is equalled only by alfalfa (lucerne), and as a producer of organic matter for green manuring it is unsurpassed.—L. C. CORBETT, *Horticulturist in Charge of the Arlington Expt. Farm, U.S. Bureau of Animal Industry*.

DUST BOXES FOR POULTRY.

Chickens never wash, as many other birds do, but cleanse themselves of insects by wallowing in soil. Where board or cement floors are used, some means for dusting should be provided during the winter months. For a flock of 50 to 60 fowls a dust box 3 by 5 feet or 4 by 4 feet will be found large enough in most instances, and should be placed where it can be reached by sunlight during as much of the day as possible. Fine, light, dry dust is the best, but sandy loam is good. Road dust is recommended by many, but it is apt to be filthy. Coal or wood ashes may be mixed with the soil if desired.—G. ARTHUR BELL, *and Assistant Animal Husbandman, U.S. Bureau of Animal Industry*.

THE GRADE OF A DITCH.

The matter of grade for a ditch is one which depends so much upon circumstances as almost to preclude rules. It is safe, however, to make the grades as light as possible to avoid "silting up" or settling. Cutting may be called perpetual motion, for if once begun it seems never to stop. The ditch gradually gets lower and lower until the water cannot be got out of it at all, and it must either be abandoned or have falls built in it to keep the flow near the surface. As far as possible keep the grade

uniform, as changing the grade tends to cause both cutting and silting. A ditch for irrigation on a farm should always be much larger than the actual demands require.—LUTE WILCOX (*"Irrigation Farming"*).

FEEDING TURKEYS.

Give the fattening turkeys all they can eat four times a day, from the time when you commence full feeding until twenty-four hours before slaughtering time. The first three of the daily meals should be of cooked potatoes and mealie meal, or of mealie meal scalded with milk or water, and the last of whole maize, varied with wheat or buckwheat. Always use maize a year old; new maize causes much trouble and may kill them. Give the first meal as soon as possible after daylight, and the last just before dark. Feed each time all they will eat up clean, but leave no food by them. Feed the pounded charcoal occasionally, and keep a supply of gravel where they can help themselves. Twenty days of such feeding will put turkeys that have been growing and in good health in the best possible condition for market.—HERBERT MYRICK (*"Turkeys and How to Grow Them"*).

GREEN MANURING.

The most important object achieved by green manuring is the addition of humus to the soil. Other things being equal, the best green manure crop is that which furnishes the largest amount of material which will readily decay in the soil and thus form humus. There are, however, additional ways in which such a crop may be beneficial. Deep-rooted plants are decidedly preferable to shallow-rooted ones because they penetrate into the subsoil. In this way air and water find entrance, especially after the roots decay. Thus in a way every deep-rooted plant is a subsoiler. It is also supposed that such plants, especially when ploughed under, tend to enrich the surface soil with potash and phosphorus from the subsoil, thus bringing these substances within the reach of shallow-rooted plants.—C. V. PIPER, *Agrostologist in Charge of Forage Crop Investigations, U.S. Bureau of Plant Industry.*

PRESERVING EGGS FOR INCUBATION.

The following method has been proved by experience to be as effective as any for preserving eggs for incubation, but the same measure of success must not, *by any means*, be expected from such eggs as from fresh ones:—Wrap up each egg in a square piece of damp proof paper in such a way that all the edges of the paper are drawn to one end and tightly twisted, thus excluding the air. Grease-proof or butter paper, which may be obtained of most grocers, is suitable for wrapping the eggs. Pack the

latter, so wrapped, small ends up, tightly into conveniently sized boxes, and when full screw down the lid and date the box. If moderate sized boxes are used, those filled first can be opened first for use. Keep the boxes in a cool, dry place, and turn over every day. Eggs have been preserved in this simple way for nearly a year, and have afterwards hatched chickens. Great care should be taken that the eggs put down are perfectly fresh, but they should not be wrapped up and packed in the boxes warm from the nest. Allow them to cool first.—J. H. SUTCLIFFE (*"Artificial Incubation and its Laws"*).

REQUIREMENTS OF SILOS.

The fundamental principle in the preservation of green forage when placed in a silo is the exclusion of air. It is the purpose of any silo, regardless of its construction, to exclude air as far as possible from the silage and in this way prevent decay. To prevent the air from reaching the silage, all silos must have air tight walls. These must be rigid enough not to be sprung out of shape by the pressure of the silage, permitting air to enter next to the wall. Not only the walls but the doors also must be perfectly air tight. . . . In addition to being air tight the silo wall should prevent the loss of moisture from the silage. Porous walls, which sap the juices from the silage and transfer the moisture to the outside of the wall where it will be evaporated, cause the silage to become dry and mouldy for a considerable distance inward. The setting of silage in contact with rough walls tends to form openings in the silage which invariably induce the presence of air. Walls which are poor conductors of heat are also very desirable in order to prevent freezing of silage next to the walls.—M. L. KING (in *"The American Thresherman"*).

Exchange Reviews.

WHAT OTHERS ARE THINKING AND DOING.

MR. LIONEL COHEN, of the Chemists' Branch of the New South Wales Department of Agriculture contributes to the February number of the *Agricultural Gazette* of the Department an interesting article on "Bare Patches: Their Causes and Treatment." In the course of his article he mentions that three cases of bare patches at widely separated locations in New South Wales have been found in which the sterility is concomitant with a considerable excess of manganese over the surrounding soil. He remarks that, as some farm crops appear to tolerate comparatively large amounts of manganese, the simplest method of utilising the bare patches would be to cultivate such crops only on them. The bare patches at Coolabah Experiment Farm are apparently due to the presence of calcium

chloride, caused probably by an impervious subsoil, which exists in places at a depth of 2 or 3 feet. This substance, being extremely soluble, would be removed from the top soil if the drainage were thoroughly efficient in these patches. The sterility of the Coolabah bare patches may also be partly caused by the decomposition of the calcium chloride by the plant in its search for lime, giving rise to hydrochloric acid. That being the case, thorough and liberal dressings of lime should restore fertility by inducing a more neutral condition, and rendering unnecessary the assimilation of the calcium in the calcium chloride by the growing crop.

Robusta Coffee.

The Department of Agriculture of the Federated Malay States have issued a bulletin (No. 7) on the *robusta* species of coffee from the pen of Mr. W. J. Gallagher, M.A., Director of Agriculture. *Coffea robusta* was discovered wild in the Congo region by Emil Laurent in 1898. The plant was taken up commercially by a Brussels horticultural firm and named *Coffea robusta* by them. Mr. Gallagher states that *robusta* differs in many ways from the well known *liberica*. The habit is somewhat different. *Robusta* grows more rapidly. An eight months old *robusta* plant is much larger and has more branches and leaves than a year old *liberica*. The branches of *robusta* are longer and have a tendency to bend down towards the ground so that the bush is rather umbrella-shaped. Gourmandisers and suckers are fewer than on *liberica*; the leaves are a lighter green, thinner, and larger in size.

Robusta bears more berries in a cluster than *liberica*, often over sixty; they are much smaller, but the beans are almost as large as the skin is thinner. On an average ten pikuls of liberian berry give one pikul of market coffee. On the other hand only four pikuls of *robusta* berry are required for a pikul of market coffee. Though many more berries go to a pikul than in *liberica* the greater number in a bunch makes the picking if anything cheaper.

Reports from the home market show that it must be heated and ground in a manner somewhat different from other coffees, and that as to quality experts are inclined to put it nearly on a level with best Santos. At present the price is about \$25 a pikul, but this will hardly be *robusta* in the Dutch Indies, mainly in Java, and it is possible that the price may fall to \$17 or \$18.

Killing Weeds with Carbon Bisulphide.

Mr. E. V. Wilcox, the Special Agent in Charge of the Hawaii Agricultural Experiment Station, discusses in a recent press bulletin the efficiency of carbon bisulphide for the purpose of killing weeds. During

the past year a number of experiments have been made with carbon bisulphide in studying its effects upon various herbaceous and shrubby weeds. In these experiments, the amount of carbon bisulphide used varied according to the size of the plant to be destroyed. On small-stemmed plants like *Crotalaria*, about a teaspoonful of commercial bisulphide was poured down the stem, from about six inches above the ground. The amount was increased, for larger plants, up to two teaspoonfuls for guava bushes three or four inches in diameter. The plants upon which most of the tests were made were lantana, guava, prickly-pear, *Stachytarpheta dicotoma* (one of the plants known by the native name Oi), and *Crotalaria incana*. In all cases, as just indicated, the carbon bisulphide was poured on the stem at a point about six inches above the surface of the ground. On most plants carbon bisulphide shows no effect until after the lapse of a considerable period; on large guavas sometimes two or three months. The effect of pouring carbon bisulphide on *Crotalaria* was to cause the death of the plant, root and branches, within four to ten days. The plants remain green, and apparently normal, until shortly before death when the leaves suddenly turn yellow and shrivel up. If the plants are then carefully removed from the soil it is found that all of the root-system is dead and the inner tissues of the roots and lower part of the stem are brown, or otherwise discoloured.

Apparently, the effect of carbon bisulphide, when applied directly to the stems of plants, is due to artificial freezing. As is well known, the liquid volatilises almost instantly and cools the surface so suddenly that the living bark is destroyed. It seems also to exercise a poisonous action, otherwise it would be difficult to explain the complete destruction of the roots to their tips, in some instances, six or eight feet from the point where the carbon bisulphide was applied. It was found, for example, that guava bushes would live for five to seven months after the bark and cambium had been entirely removed from the surface of the ground up to a height of two feet. Moreover, the destruction of the bark at the base of the trunk by concentrated sulphuric acid was not sufficient to cause the death of the guava bush for about six months. Apparently, therefore, carbon bisulphide causes the death of plants by its freezing effect and also by a poisonous action. Mr. Wilcox reminds us that in using carbon bisulphide the fumes, if inhaled continuously, may produce serious effects upon the workmen, and also that the material is highly inflammable and should be protected from accidental flames. The effect of the fumes upon workmen include headache, dizziness, hysterical excitement, and, finally, a rather serious weakness, a feeble pulse and other symptoms of prostration. If it is used, therefore, in the eradication of weeds, these effects should be borne in mind in order to protect the workmen.

Among the Farmers.

THE ASSOCIATIONS DURING THE MONTH.

LOWER TUGELA.

THE annual meeting of the Lower Tugela Division Association was held at Stanger on 15th April, the Vice-President, Mr. A. E. Foss, presiding.

The President (Mr. W. R. Hindson) referred to the death of Mr. David Brown since the last meeting, and stated that Mr. Brown was the first president, and held that office for four years. He took a keen interest in horticulture and agriculture matters, and had given the Association the benefit of his knowledge and experience. The speaker moved a vote of condolence with the widow and family of Mr. Brown, and the resolution was passed by the members standing.

The following annual report of the President was read:—

In my report for last year, I referred to the atmosphere of suspense in which we were then living, owing to the impending change in the political relations of the various Colonies of South Africa, which was exciting such keen attention and discussion throughout the country at the time.

The union of the four interested Colonies into one South African Dominion is now an accomplished fact, and although the convention on which that Union is based was practically unanimously agreed to by the electors throughout South Africa, and the Convention itself hailed as a masterpiece of Statesmanship, the feeling of suspense and anxiety as to how this Union is going to effect us here in Natal has not altogether abated. I think I may say, that to many of us the outlook is not quite as bright and hopeful as it was when the Convention was concluded. There are one or two clouds in the sky. The utterances of different political leaders incline us to fear that racial feeling is not quite dead, and this element, if allowed to influence practical politics in any direction, will be subversive of the best interests of the Union in all its parts.

Another cloud, which more nearly affects us in Natal, is the present precarious position of the labour question—a question which we understand is left for the forthcoming Union Parliament to settle, in so far as the continued introduction of indentured Indians is concerned.

Apart from any question of the stoppage or non-stoppage of indentured Indian labour, in the near future, the present labour supply in Natal and Zululand is not sufficient for the industries that are now

established. The soil and climate of Natal are distinctly favourable not only to the industries alluded to, but to several others which would be undertaken were we assured of a permanent supply of reliable labour at such a price as would yield a fair profit on the undertakings in which it would be engaged.

The report of the Commission on Indian Indentured Labour was absolutely convincing of the necessity of the continuation of Indian immigration. To this report was added a rider recommending the indenturing of young Natives; if this could be done, it would materially relieve the situation and prove advantageous not only to planters and farmers, but to the Natives themselves.

But indenturing Natives—even if it could be accomplished—would not for many years to come, if ever, be a satisfactory substitute for the present system of importing indentured Indians. This is very distinctly felt by all who know anything about the labour requirements of the Colony, present and prospective.

It would be well at this juncture for planters to combine and organise labour agencies to recruit Native labour for work on the estates. This, at all events, would test the position with regard to this class of labour, but it must be emphatically impressed upon the legislators of South Africa, everywhere, that Natal cannot do without Indian indentured labour.

Look at our crops for the season just coming to an end—what has been done?—and then think what more could be done with a plentiful supply of labour.

Take our principal Coast industry—sugar—the season has been a most favourable one for the growth of this staple. The output from the mills between Tongaat and the Tugela is estimated at 15,000 tons, and this will be more than doubled by the sugar produced in Zululand. This industry, in addition to the shortage of labour alluded to, is severely handicapped by the lack of transport and the deficiency of manufacturing equipment along the Coast. To meet these drawbacks, early cutting of the cane has to be resorted to, as it is thought better to cut prematurely than to be unable to deal with it at the end of the season. It is estimated that, between Tongaat and the Tugela alone, some 2,000 tons of sugar will have to remain on the field until next year, and as it is further estimated that the 1911 crop will be fully fifty per cent. more than that of the present season, if no new mills are erected, or those in existence considerably enlarged, there will be a very heavy loss to the planters during the next two years.

If a sufficient supply of labour for present and future were assured, capital would very readily find its way into Natal for the equipment and extension of present industries, as well as for the development of others.

In connection with the sugar industry, there is an important point, which has already been discussed by our Association, that is, the necessity for having new varieties of cane introduced on to the land. "Upa" cane has done exceedingly well so far on the Coast, but is not the danger of having "all our eggs in one basket" to be feared for the sugar industry? Are sugar planters convinced that they have got the best and most suitable variety of cane to be had? If not, it would be well to obtain and experiment with other varieties before signs of deterioration in our present cane are evident.

TEA.

The tea industry on the whole has not made satisfactory progress. In the early part of the season, owing to unfavourable weather conditions, planters feared they would not reach their estimates, but latterly better conditions have prevailed, and the shortage in the beginning of the year will, it is hoped, be fully made up. It is satisfactory to know that the quality of the output of the various estates shows a distinct improvement on that of previous years. That this is appreciated by consumers is shown by the fact of the increasing demand for the South African product. The supply of the finer grades of Natal tea last season was considerably less than buyers' requirements, and the same state of things is likely to happen again this year. Very unfortunately, however, for planters, competition in the tea trade is so keen and the prices, both of the imported and the locally produced article, cut so low, as to render the industry unprofitable to those engaged in it. The industry received a fatal blow at the Bloemfontein Customs Conference, when the import duty on overseas tea was reduced from *sixpence* to *fourpence* per lb. This change was quite uncalled for, and it was a gross injustice on those who had invested their capital—permanently—under the protection that existed before the reduction of the duty took place.

MEALIES

Mealies have come on well on the Coast, but owing to difficulties of transport and low prices obtained, the area of cultivation has been further restricted. Indians, who are the principal mealie producers, now find it more profitable to plant sugar cane and other crops.

There is one industry, which I alluded to in my last year's report, *viz.*, "dairying," which, with the elimination of stock diseases, should be a very profitable one on the Coast. With our perennial supply of rich green grass and with good stock, and proper care and attention in every department, milk and milk products should yield a rich reward.

This brings me to the present condition of our district with reference to cattle diseases. The district is now, and has been for a considerable time, practically free of East Coast Fever, and I have not heard of any other trouble amongst cattle. Surely the time has now arrived when the

re-stocking of this district with clean and suitable cattle may be undertaken safely. The urgent need of ox transport is apparent on every side. The absence of it is still causing serious loss to large and small cultivators alike. I would recommend that Government be urged to institute an enquiry into the present state of the district, with a view to the immediate re-opening for the introduction of horned stock—under Government supervision. It is well known that cattle from elsewhere have been brought into the district within the last twelve months; these cattle have done well, and there has not been the slightest sign of a recurrence of the East Coast Fever. The season for horses has not been a good one, so-called Horsesickness has been very prevalent, and although the system of “smoking the stables” has done a great deal to check this disease, yet a good many deaths of horses have taken place. Very fortunately “Lymphangitis,” with which we were threatened in the early part of the season, has not made any headway; in fact, you may take it, that the district is now free of this disease.

I have left the consideration of the present position and attitude of the Native population over to the last, because, to my mind, this, if it is not just now, will be, before very long, by far the most serious problem we shall have to deal with. But, even now, what are the Natives doing in our own district? What character do they bear collectively? I am told on every hand that the Natives are becoming more immoral, less law-abiding and less respectful to the white man every day. I do not hesitate to say that the Natives living on private farms and estates are simply “cumberers of the ground” and a nuisance. They “toil not, neither do they spin,” and, what is economically worse to the landowner, they don’t pay rents. As the European population on the land increases every year, and extension of cultivation takes place, a process of shifting and moving goes on, and the Native is being gradually edged out of the way by the inevitable law of process. But this process is having a dis-affecting and demoralising effect on the Native mind, and a wise and firm supervision, with a rigorous administration of the law, is absolutely necessary to prevent serious trouble. I would not consider this matter, only from the economic and sociological standpoints, but also from the point of the welfare of the Natives themselves. We Europeans have a great responsibility towards these people, and that responsibility calls for, not only discretion and absolute fairness in our personal dealings with them, but we must enforce, both by our own conduct, and by our unflinching application of the law, a greater respect for the white man and for the laws that govern the community.

In conclusion, I have again to thank our ever accessible and esteemed secretary, Mr. H. Curtis Smith, for his assistance during the year. Mr. Smith certainly does more than anyone else to keep the Association in existence, with, I am afraid, only meagre encouragement.

A balance sheet showing the financial position of the Association has been prepared, and will be now read by the secretary and then laid before you.

The Secretary read the balance sheet, showing a balance in hand of £507s.

The Chairman having proposed the adoption of the report, Col. F. Addison seconded, and in doing so drew attention to the remarks in the report regarding the Natives, and said matters in that respect were becoming serious. He had been trying to get men punished for offences against himself such as trespassing, pulling down fences, setting fire to cane and barracks and robbing of gardens, and they were beginning to retaliate. He was sorry to have to speak in that way regarding the Natives, but he could only put it down to the weakness of the officials in the district in administering the law and the failure to detect the criminals. It seemed they would have to take the law into their own hands shortly, with the possible result of some white man committing a crime against the Natives.

The following officers were elected:—President, Mr. A. E. Foss; Vice-President, Mr. W. R. Hindson; Hon. Secretary, Mr. H. C. Smith; Committee, Messrs. F. Addison, T. G. Colenbrander, A. S. J. Hulett, J. G. Stuart.

MID-ILLOVO.

THE fifteenth annual meeting of the Mid-Illovo Farmers' Club took place in the Mid-Illovo Hall on the 14th May. Mr. H. S. Power, J.P., was in the chair, and there were present, among others, Messrs. B. B. Evans (Vice-Chairman), L. G. Wingfield-Stratford, J.P., Jos. Ballam, P. H. Woolley, W. A. McCullough, R. A. Cockburn, W. E. Antel, J. H. Forshaw, Joseph McCullough (Hon. Treasurer), and A. L. Wingfield (Assistant Hon. Secretary).

The following address was delivered by the Chairman:—

Gentlemen,—It is with pleasure, not altogether unmixed with regret, that I have now to place before you my report as Chairman of the Club for the past year, on this our fifteenth annual meeting. Pleasure, inasmuch as it is impossible not to feel gratified with the individual effort so apparent through the Mid-Illovo and contiguous districts in the increased acreage of mealies and wattles, regret when one considers the paucity of the attendance at our monthly meetings and the lack of combination existing among us generally. As regards this attendance, whilst admitting the exigencies of East Coast Fever, and that some of our members are engaged in Government work, thus rendering them unable to attend the meetings, I do think an effort might be made by others, not

so engaged, to be present more regularly, and then a greater interest in work which must be admitted is for the benefit of the members themselves and the districts they represent.

It is certainly most striking to the observer the fact that some months ago when any reference was made on the notice cards to a discussion with regard to results of interviews with Ministers on the then problematical Mid-Illovo railway, how members turned up in force to participate in these discussions, and the difference in attendance now that the start of the construction of this railway has become an accomplished fact.

I would like to say, gentlemen, that we ought not to consider the railway as the be-all and end-all of our aims, although admittedly a great factor in our future prosperity, but that we have much to learn on improved methods of agriculture, and discussions on this and other matters can but be for our own advancement. Because, apparently, a slackness exists among many other associations in their attendance at meetings and the work done, it appears to me we should show more determination in making ours an exception to the rule.

MEALIES.

This, our staple product, I mention first, and regret to say although, as I have previously stated, an increased acreage has been planted, yet, owing principally to weather conditions, the crop cannot be termed good, and, as far as I can gather from other sources, the same may be said of many other parts of the Colony. Grub has been less in evidence this season than last in the district, and it is to be hoped that the return of better rainy seasons may return its aggressiveness. Another thing I would like to mention with regard to mealies, and that is I consider continuous horse-hoeing of very material advantage to the crop. It is the custom with many farmers to put the horse hoes through two or three times, and then leave the mealie to find for itself. By this procedure the weeds are insufficiently checked, and the mealie suffers. If every farmer would adopt continuous horse hoeing, I am sure the excess of yield would amply repay them for all extra trouble and expense incurred.

While on the subject of mealies, I must refer to the Natal Mealie Growers' Union, whose objects you are all doubtless aware of. Considering the benefits to be derived from membership, the smallness of the fee, 10s., and the possibilities of development in many ways of such an Union, I can only advise every member of this Club to lose no time in sending to the secretaries, Messrs. Duff, Eadie & Mitchell, their secretaries.

WATTLES.

The acreage in our districts appears to be increasing by leaps and bounds, and the remark I think applies to some of the other wattle-growing centres also. The price remains satisfactory, and their seems



CARAVONICA COTTON.—I.

Caravonica Cotton Trees, 18 months old, grown on Mr. Löffler's farm,
Bululwana, Zululand.

(See "*Correspondence.*")



Caravonica Cotton planted in December (with mealies) : height now 5 feet.



Caravonica Cotton planted in November on Mr. Loffler's farm, Bululwana, Zululand.

CARAVONICA COTTON.—II.

(See " Correspondence.")



RAMIE.

Ramie growing on Mr. Loffler's farm Bululwana, Zululand. Three weeks' growth : height, 4 feet.

(See "*Correspondence.*")

little chance at present of supply exceeding demand, and when one comes to consider the large acreage cut down yearly as against the five to six years' growth required for new plantations, the reason for this maintenance of price seems fairly obvious. With regard to close planting, which now seems to be the order of the day, I cannot but think this is a mistake, and a big one too. I know that some men think the more trees they grow to the acre the bigger will be the return of bark, but I am emphatically of the opinion the reverse is the case. I do not wish to pose as an expert in this matter, but imagine that any thinking man will agree for trees to give of their best they must have sufficient root space and light to admit of them doing so, and I do not see how that is possible by the present system of planting 9 feet by $4\frac{1}{2}$ feet.

EAST COAST FEVER.

Unfortunately this terrible scourge is still with us, and fresh outbreaks are constantly occurring. So far the South African Governments have been unable to find a preventive, and indeed the chances of preventive or therapeutic treatment being discovered seem by no means hope-hopeful. The so-called preventives of Mr. Otto and others have proved miserable failures, many farmers having not only to record the loss of their cattle, but considerable disbursements of hard cash in payment of such preventives. Isolation, cleansing and fencing seem to be the best safeguards we know of at present, and while on this subject I would like to refer to a letter I received from the Government Bacteriologist in answer to one of mine, asking for his advice, and which I am sure he would not mind my referring to under the circumstances. He advocates systematic cleansing, and paddocks being cut up into as small areas as possible, while they are still clean. He suggests one paddock, if possible, as a quarantine paddock for observation purposes, and then should an outbreak occur, temperature, cleanse and remove all the normal cattle into a clean paddock. Should they again break down, repeat the process. By this means, gentlemen, the disease is localised to the paddock in use and, as one can easily see, a man may get hit, and even hit hard, but he stands an exceedingly good chance of saving a large percentage of his herd. I most strongly recommend every man who can follow this advice to do so without delay.

HORSESICKNESS.

This disease, I am glad to say, our districts have been practically free from this season, and there is little reason to doubt that the extra care taken by farmers in smoking their stables is the chief cause of this immunity. One cannot lose sight of the fact that some seasons a district becomes more grossly infected owing to more suitable weather conditions for the breeding of the mosquito. In seasons of this sort continuous stabling, if possible, or, in any case, only having the animals exposed

during sunlight through the sickly period, is the remedy, until such time as a preventive is at our disposal.

RAILWAY.

I am sorry to have to state that owing to details in the construction work the line will probably not be finished as far as Cleveland Hill until August next. This, of course, means increased delay in its arrival at Mid-Illovo Central, and increased worry to all of us with transport difficulties. The only comfort we have is that it cannot be many more months before the railway is with us, and when this time comes I sincerely hope the troubles, which have so adversely handicapped us hitherto in marketing our produce, will become things of the dead and forgotten past.

FERTILISERS.

With regard to this most necessary material, I would suggest that if members of this Club would only combine together and order through the Club, we should undoubtedly be enabled to purchase our requirements at a cheaper rate than we do at present, by buying independently. Other associations do this, and I cannot see why we should not follow in their lines, more especially as after this season we can take delivery here, on rail; in fact, many have already bought on the understanding that the fertilisers will be delivered at Mid-Illovo Station in October next.

OSTRICHES AND RUBBER.

These are two things which have been so much before the public lately that I consider that I am justified in touching upon them, as we have sons to consider in the future as well as ourselves. With regard to the former, there are undoubtedly several farms in these districts that would carry them well. After reading the very interesting report of the Cape Expert on Natal's suitability for ostrich breeding, taken together with the demand for the feathers, which appears to be as safe as most things in this world, the prospects seem very alluring; and I hope that it will not be long before we see ostrich farming carried on around us. The two great things necessary to success, taking for granted that a farm is suitable, appear to be the right class of birds and lucerne feeding.

As regards rubber, I think I may say Ceara is the only one variety presenting possibilities of being grown in Natal and Zululand profitable. The tree will grow well in parts of Zululand, and even in some parts of Natal, where particularly well-sheltered spots are chosen and where frost is a negligible quantity. The one thing we desire further proof about before undertaking on rubber growing, is the free-running of the latex, and unfortunately this proof is not, as yet, forthcoming. Should this once be proved satisfactorily a new industry will arise in those places suitable to the growth of the tree; and many fortunes derived therefrom. In the Mosambique Company's territory the tree is a success, and is

tapped heavily for three days at the beginning and end of the rainy season. These tapplings have produced 8 to 9 ounces of rubber from four-year-old trees, and the quantity increases with the age of the tree. What the results from a hundred acre plantation would mean at present prices, or even at a considerable reduction, I leave you to imagine.

NATIVE LABOUR.

Other things I feel ought to have been touched upon, such as tobacco-growing, pig-breeding, tractors, etc., all of which subjects interest us, but my report is, I fear, already too long, and I must close it with a reference to native labour. You are all aware of the trouble experienced through these districts in our inability to obtain sufficient labour during the hoeing of the crop. Johannesburg is, of course, one cause of the shortage, and the other is the continuous daily beer drinks through the summer, and, to a less extent, through the winter. How to surmount the latter trouble I do not clearly see, but I think if such a thing were possible and the Government would bring forward legislation limiting these drinks to one day a week, we might then expect to obtain labour five days out of the six. I certainly consider Government should do something in the matter, as you all know that not only do the Natives neglect their own crops altogether, with the exception of their mabela fields, but the morality for which years ago the Native women and girls were famous is to-day conspicuous by its absence.

Gentlemen, in thanking you for your attendance here to-day, I have also to thank our honorary and assistant hon. secretaries for the able and thorough manner in which they have discharged the onerous duties devolving upon them.

OFFICE BEARERS, 1910-11.

Mr. H. S. Power was unanimously re-elected Chairman, and Mr. B. B. Evans was re-elected Vice-Chairman. Upon the proposition of Mr. R. A. Cockburn, the other officers were re-elected *en bloc*.

Correspondence.

COTTON AND RAMIE AT NONGOMA.

TO THE EDITOR OF THE "AGRICULTURAL JOURNAL."

SIR,—I enclose four photos of cotton and ramie fibre, grown near here which may be of interest to some of your readers, as they give a good idea to what height these can be grown. Unfortunately, the photos are taken a little too soon. If taken a month or six weeks later the cotton trees would show up one mass of white, as they will then be ready for reaping.

The photos are taken on Mr. E. Löffler's farm, on the Bululwana, near the Usutu Kraal.

Number 1 shows some trees on a half-acre patch planted in November, 1908, as an experiment. These grew so well, and the samples of cotton being reported on so favourably by the British Cotton Growers' Association, that Mr. Löffler at once decided to grow on a large scale, with the result that he has now some 60 acres under cotton, most of which was planted between September, 1909, and January, 1910.

Photo number 2 shows a portion of that plantation in December last with mealies, the mealies acting as a shelter for the young plants. The mealies have been reaped and averaged ten bags to the acre; the ground in between was then ploughed up, and the trees are now looking very healthy and stand about 5 feet high.

Photo number 3 shows cotton planted in November last. This promises an exceptionally good yield this year for such young trees; the trees are full of blossom.

The conditions under which cotton can be grown in Zululand are, I should think, the most favourable in the world. We have a warm climate with a good rainfall for about seven months, and just as the cotton is ripening the dry weather set in, and the cotton can be reaped without being damaged.

Cotton-growing is an industry which, I think, should be brought more before the eye of the public, as I am certain there is a big future for it, and in these days when there is so much talk of closer settlement and small farms, cotton growing should be given a trial.

I also enclose a photo, number 4, of a field of ramie fibre on the same farm three weeks old and now standing over 4 feet high. The plants are 18 months old and have been cut down several times. In the summer months they grow to a height of 6 feet in six weeks, and during the summer months can be reaped every six weeks.

According to all accounts, ramie-growing would be a most paying crop with proper machinery for getting out the fibre. I understand that Mr. Löffler has ordered a decorticating machine from England and expects it to arrive daily. If this machine proves a success (and Mr. Löffler is confident it will) he intends putting every available bit of ground under ramie.

I hope to be able to give you further information in a couple of months' time, when the cotton crop is ripe and the ramie machine has been tested.—Yours, etc.,

C. T. V.

Nongoma.

[We reproduce in the present issue of the *Journal* the photos referred to in the foregoing.—ED.]

THE FARMER BOYS' PAGES.

MONTHLY ARTICLES, NOTES AND PARAGRAPHS ON
ELEMENTARY AGRICULTURAL SUBJECTS

FOR

BEGINNERS IN AGRICULTURE AND STUDENTS GENERALLY.

Conducted by "ARATOR."

* * Correspondence, whether in the form of notes, comments, or inquiries, is invited from readers, and letters of general interest will be published and replied to in these pages. All communications should be addressed to "ARATOR," C.O. Editor, "Natal Agricultural Journal," Maritzburg.

Fruit Culture.

SOME CHATS FOR BEGINNERS.—II

By "POMUS."

PLANTS obtain their food from the soil by means of their roots. The various substances required for the growth of the plant are dissolved by the water in the soil and held in solution. This water is absorbed by the roots and passes up into the plant or tree, when it is known as "sap." From cell to cell it makes its way upward through the sap-wood until it eventually reaches the leaves. In the leaves the sap is spread out to the light of the sun. Through the pores in the leaves a considerable portion of the sap is evaporated and the residue consequently gets thicker. The atmosphere, as probably everyone knows, contains carbonic acid, and this substance now combines, entering through the leaf-pores, with the oxygen and hydrogen contained in the sap, and this resulting triple compound of carbonic acid, oxygen, and hydrogen undergoes further change—the oxygen of the carbonic acid escaping. Thus elaborated, the sap descends the branches and trunk, and forms a layer of fresh substance between the bark and the wood, called "cambium," most of which becomes new wood, but a small part of which forms new bark.

These facts should be borne in mind whenever any grafting or budding (processes which I shall describe later) is being done. The junction of graft or bud with the stock has to be done in such a way that

the sap from the roots of the stock may flow up through the sap-wood into the new shoot, and so that the cambium of the shoot (in grafting) may coincide with the cambium in the stock.

We have seen that sunlight is required by trees and plants for the purpose of producing the changes in the sap, when it reaches the leaves, necessary to enable it to fulfil its proper functions on returning through the branches and stem of the plant. This fact will make it clear that down to a certain point the fewer leaves a plant has the healthier and more vigorous will it be, and at the same time we have seen that leaves are necessary in order to enable the sap to come under the influence of the sunlight, so that, taking all things into consideration, there must be a point beyond which too many leaves, and below which too few leaves, are equally undesirable. This point in normal conditions is fixed by nature herself, but there are times when a tree loses its leaves as a result of the depredations of some insect pest, and as a consequence the health of the tree suffers. In fruit culture this question of the proportion of leaves is of considerable importance. If the leaves are too thick the fruit will be inclined to be inferior or bitter, since they are unable to ripen fully. Plenty of sunlight must be admitted to the leaves and to the fruit itself in order to obtain the best results, and this is one of the reasons why thinning and pruning are of such importance.

Whilst we are discussing the part played by leaves, reference should be made to the rapidity with which they exhale moisture. I have, of course, just now referred to the fact that moisture is thrown off by the leaves, but what I should like to draw attention to is the practical lesson which is to be deduced from this fact. In transplanting a tree care has to be taken to remove a considerable proportion of the leaves, which, if allowed to remain, would kill the plant by withdrawing from it and throwing off the moisture which it contained, before a fresh supply of moisture could be absorbed by the roots in their new surroundings. For the same reason it is advisable in transplanting to remove a portion of the top of the young tree corresponding as near as possible to the proportion of roots lost in digging out the tree. I shall, of course, discuss the matter of transplanting trees in its proper place, but I thought it would be as well, since we have been talking of the functions of leaves, to point out the reason why leaves must be removed in transplanting young trees.

A few words now about flowers. The object of flowers is to ensure the production of seeds. Surrounded by specialised brightly coloured leaves flowers contain two essential organs, which are in some cases to be found both in the same flowers and in others in different flowers. These two organs are known respectively as the "stamen" and "pistil." At the head of the stamen is what is called the "anther," which contains a powder

called "pollen." The pistil is in essence a tubular structure; the upper end is known as the "stigma," and towards the lower end the tube expands into a sac which contains the rudimentary seeds. When the anthers have matured they burst, and—in the case of flowers in which both the male organs (stamens) and female organs (pistils) are both in the same blossom—the pollen is discharged and falls over the stigma at the upper end of each pistil. By this means the ovules or rudimentary seeds in the sac below are fertilised and seeds are the result. In some cases, as I have said, the stamens and pistils are in different flowers, in which case it is necessary either for the wind to blow the pollen to the pistils or for bees to carry it on their bodies, which they do in seeking for the nectar at the bottom of each flower. The pollen is thus carried from the male flowers to the female flowers, fertilisation takes place, and seeds are the result.

(To be continued.)

Agricultural Chemistry for Beginners.

BY ARCHIBALD PEARCE.

CHAPTER VIII.

POTASH.

IF some fresh wood-ashes are shaken up with a little water, we shall apparently notice that they do not dissolve at all; but let us apply a few tests to try and prove the truth or otherwise of our observation. First, strain off the water through cotton wool or, better still, white blotting-paper; we shall obtain a liquid nearly as clear as water. But let us taste it; it has a kind of soapy flavour; test it with red litmus paper, the colour changes to blue; drop a few drops on to hot iron, a whitish deposit remains. We must therefore conclude that wood ashes contain a white alkaline substance which can be dissolved out by water, leaving the larger portion of the ash as an insoluble residue. This substance is one which for many years was manufactured in just this way; in countries where wood is cheap and plentiful, like Russia and Canada, large quantities of timber were collected and burned, the ashes soaked in water and strained off, and the liquid boiled down in large iron pots till only the solid substance remained, and to this the name pot-ash was given. If this potash is treated with an acid, it effervesces and gives off carbon dioxide; it is therefore a carbonate, and we now know that it is the carbonate of the

rare metal potassium. If this potash is boiled with lime, its alkaline properties are very much increased, in reality it has become a new potassium compound called caustic potash, which is made in large quantities for the manufacture of soap and other purposes. Its chemical name is potassium hydrate. Now, unfortunately, the term potash is used very loosely in ordinary language, no less than three different substances being spoken of by the same name, which is confusing and misleading. First, there is the potash which is obtained by washing wood ashes, and which is really the carbonate, as explained; secondly, the hydrate, made by boiling the carbonate with lime, is often spoken of simply as potash; while the compound which properly and correctly has the name of potash given to it is the basic oxide of potassium, from which all the potassium or potash salts are formed. We must remember then that when we speak chemically of potash, we are always referring to this oxide, because we compare the value of all potash salts by calculating how much of this oxide each of them contains.

If the ashes of any plant, or any portion of a plant, are examined, we are always able to detect the presence of potassium in the form of its carbonate, and hence it follows that all plants must have potash salts in some form or other for their growth. But all plants do not require the same amount, nor are all parts of the same plant equally rich in potash. We find that the ashes of the trunk of a tree contain very much less than the same weight of ashes derived from the twigs or leaves. As a general rule the harder and older the parts of a plant are the less potash they contain. Again, some kinds of plants can get on with comparatively little, while others require a large amount. Of plants of the latter kind, the potato is pre-eminent, and this crop may be said never to fail to give an increased return for manuring with potash. Tobacco also has almost always a potash dressing applied to it. Root crops and leguminous crops, too, like a good supply, while cereals only need an application when the soil is very poor in this form of plant-food. On such soils fruit trees are grateful for an additional quantity; it is said to have a tendency to produce a growth of fruit, while nitrogenous manures help to make the trees run to wood. The question then arises as to what soils need potash manuring most. Of course a definite answer with respect to any special soil cannot be given without an analysis, but it is possible to some extent to judge from the character of a soil what the probabilities are. Almost all the potash contained in the soil came originally from the wearing down of a mineral called felspar, which is a constituent of the older rocks like granite and whinstone, and soils derived directly or indirectly from these rocks will generally contain sufficient potash to keep them going, except for special potash-loving crops like potatoes. Such soils are usually clays

or clayey loams. But sandy soils, which consist largely, of grains of quartz, are almost always poor in potash, since quartz does not contain any. Moreover they have not so much power as clays of holding soluble salts in their grip, so that the rain does not wash them away, and therefore any potash they may obtain has a tendency to gradually diminish in quantity. Any soil which contains an abundance of decaying organic matter will naturally not be very deficient in potash. There is one rather remarkable point in connection with sheep-farming which is worth notice, and that is that the grease of wool contains nearly half its weight of potash salts, and in the wool-washing districts of France about £100,000 worth is extracted annually from this source. It is therefore to be noted that on a sheep farm large quantities of potash are removed from the soil every year in the wool, and that the soil is more rapidly exhausted of this constituent if grazed by sheep than by other animals.

WOOD ASHES.

There are four substances in use in the Colony which are applied to the soil in order to supply it with potash; these are wood ashes, sulphate of potash, muriate (chloride) of potash, and kainit. The first of these is an excellent manure, if it can be obtained in sufficient quantity, because in addition to the potash it contains all the mineral constituents of the original plant with the exception of the nitrogen, and of these the chief are the lime and phosphoric acid. As has already been pointed out, the value of a potash manure must be decided by the amount of potassium oxide it contains; but that of ashes varies so greatly, both according to the kind of plant they were made of and the soil it was grown on, that it is impossible to give even an average percentage that might represent their value nearly enough for practical purposes. To illustrate this fact, and also that some plants need more potash than others, a few instances are given below, showing the amount of ash and potash contained in it, obtained from 1,000 lbs. of the dried products mentioned:—

	Ash.	Potash.
	lb.	lb.
Pine wood	3½	½
Oak wood	13½	1½
Willow wood	28	2¾
Vines	89	41½
Oat (grain)	29	11
Maize (grain)	15	5½
Oat (straw)	54	10½
Potato (tuber)	43	27

SULPHATE AND MURIATE OF POTASH.

These are concentrated manures, the former containing about 50 per

cent., the latter about 60 per cent., of potash. These are the qualities that have been on sale in the Colony, but lower qualities are made, and a guarantee should always be required in buying. They are at first sight rather costly, but it must be remembered that in buying them one obtains a large quantity of potash in a small bulk, and hence a great deal is saved in freight. The price of both is nearly the same, so that the potash in the muriate is the cheaper. Some agriculturists, however, feel a reluctance to use chlorides (*i.e.*, muriates, see Chap. II.) in any form on their crops, as there may be, in some cases, a danger of harming the plant. In the case of tobacco, there is no doubt that chlorides are harmful. Still, the muriate has been largely used, and with success, so perhaps the danger is rather remote.

KAINIT.

This is a natural mixture of various salts obtained from mines in Germany, containing little potash compared with the other two, only about 13 per cent. Accordingly it takes about 4 tons of kainit to give as much potash as a ton of sulphate, and $4\frac{1}{2}$ tons to equal a ton of muriate. Being sold exactly as it is dug, it is not expensive, but where it has to be carried any distance, the cost of carriage usually makes it cheaper to buy the concentrated salts. The potash exists in kainit in the form of sulphate, the remainder being mainly common salt, about 30 per cent., and the sulphate and chloride of magnesium. It is rather dangerous to apply in contact with the seed, on account of the action of the salt in it; it is said to be very useful for mangolds, which being originally a seaside plant, delight in a little salt.

QUESTIONS.

1. What are the manurial ingredients contained in wood ashes?
2. Why are wood ashes spoiled if left out in the rain?
3. Mention some crops that specially need potash?
4. Name the ordinary potash manures.
5. If kainit costs £3 10s., muriate and sulphate each £15 per ton, which is the cheapest to buy (*i.e.*, from which do you get the most potash for the same money)? Will it make any difference if you live 100 miles from the place of sale, the cost of carriage being 1d. per ton per mile?
6. Why is it dangerous to put kainit in the drills with the seed?
7. What sort of soils stand most in need of potash manure, and which least?
8. What different substances are called potash?
9. What parts of a plant contain most potash?

The critical period in the young turkey's life is generally at an end when six weeks of age.

The Principles of Manuring.

III.—NITRIFICATION.

WE have seen that nitrogen occurs in greatest abundance in a "free" condition in the air. This substance occurs in the soil as organic nitrogen, nitric acid, nitrous acid, and ammonia. The largest proportion is to be found in the first of these forms. In order that plants may be able to make use of the nitrogen in the soil, it has to be converted into "nitrates." This process of conversion is termed nitrification, and is brought about by the agency of a micro-organism—or rather two such organisms. The first of these is the nitrous organism, which causes the conversion of ammonia into nitrous acid; the second is the organism which changes the nitrous acid into nitric acid. (The result of the first stage of conversion is the production of nitrites, the second stage produces nitrates.) These two organisms are what are technically known as ferments.

Obviously, this process of nitrification is a very important one from a practical point of view, since it means that unless conditions are favourable for the growth of the organisms which produce these changes in nitrogen, the nitrogen in the soil will not be available for use by plants. We have, therefore now to observe what are the conditions favourable to nitrification.

In the first place, these bacteria cannot develop without a free supply of oxygen, and it therefore follows that, as was stated towards the conclusion of the preceding article, tillage is necessary in soils which are not sufficiently ventilated, so as to admit air freely. It will be apparent, therefore, that a water-logged soil is particularly unfavourable to nitrification. A water-logged soil is, indeed, even more unfavourable to the prosecution of these changes by reason of the fact that its temperature is too low. This brings us to the consideration of another of the conditions which affect the rate at which nitrification takes place. Roughly speaking, in a soil of which the temperature is lower than about 38 deg. Fahr. or above 130 deg. F. no nitrification takes place. When the temperature is between 50 and 100 deg. nitrification is most active. Whilst, however, nitrification cannot continue in a water-logged soil, the presence of a certain amount of moisture is another of the necessary conditions of nitrification. Whilst on the one hand too much water lowers the temperature and excludes air, on the other hand nitrification cannot take place in a dry soil: up to a certain point the more moisture there is in a soil the more rapidly does nitrification take place. Another con-

dition favourable to nitrification is the presence of certain plant food constituents. The presence, for instance, of phosphoric acid is believed to be absolutely essential. There are other constituents which are probably necessary, including potash and magnesia, but no definite conclusions appear yet to have been arrived at in this connection. Again, another necessary condition is the presence of a "base" in the soil with which a combination may be made by the nitric acid. Lime affords the required base, and the soil must therefore be supplied with a certain quantity of carbonate of lime in order to enable nitrification to proceed. At the same time there must not be too much lime—or, in other words, the soil must not be too alkaline—otherwise the process will be retarded. The application of gypsum has the effect of neutralising too great alkalinity, so that if a soil is considered to contain too much lime the application of gypsum will neutralise the ill effects from the point of view of nitrification. Common salt arrests the process of nitrification. Salt is applied often as a manure (it is not really a manure in itself, but it has the effect of releasing the stores of potash in the soil), but when it is so used it should be applied sparingly on account of the retarding effect it has on the process of nitrification.

(To be continued.)

Tests for Students.

SOME USEFUL QUESTIONS AND ANSWERS.

MOISTURE.

Question 1: Why do we need to have moisture in the soil?

Answer: We need to have moisture in the soil because plants cannot grow without water, no matter how much plant food they may have.

Question 2: In what two ways is this water in the soil used?

Answer: (a) To dissolve the plant food in the soil so that it can enter the plant, (b) to help build up plant tissue and maintain the life of the plant.

Question 3: Do growing crops use a large amount of water?

Answer: Yes. Growing crops use a very large amount of water.

Question 4: What is the most common cause of the failure in crops?

Answer: The most common cause of the failure of crops is the lack of sufficient water.

Question 5: What are the three forms of water in the soil?

Answer: (a) Free, (b) capillary, (c) hygroscopic.

Question 5: What do we mean by "free water" in the soil?

Answer: When rain falls on the surface of the earth a part of it sinks into the soil until it reaches a hard layer of earth or rock. This water is the source of supply for springs and wells, and is known as *free water*.

Question 7: What is "capillary water"?

Answer: Capillary water is the water which adheres to the soil particles, or is in the openings between the particles. This water is not controlled by gravity, but passes from one part of the soil to another, which tends to keep the soil in uniform condition as far as moisture is concerned. The capillary water is the direct supply for plants, and should be carefully provided for and saved.

Question 8: What is "hygroscopic water"?

Answer: Hygroscopic water is the water which is held firmly as a film surrounding each particle of soil. It is held so firmly that it is driven off only when the soil is exposed to a temperature of 212 deg. F. This water is of service to plants only during the most excessive droughts.

Question 9: What are "wet lands"?

Answer: Wet lands are lands which contain too much free water. Soils which are dryish and crumbly usually contain sufficient water for the growing of plants. Lands in good condition for the growing of crops are moist, not wet.

Question 10: What is the first step toward utilising the water of the soil?

Answer: The land should be so prepared that the rainfall may be stored. The soil should be put in such condition that it will readily absorb water.

Question 11: How does tillage enable soils to hold moisture?

Answer: Tillage enables soils to hold moisture in two ways—(a) by increasing the depth of the soil, (b) by increasing the capillary power of the soil.

Question 12: What do we mean by conservation of moisture?

Answer: Conservation of moisture means the prevention of the unnecessary waste of capillary water of the soil. It is the saving and using of moisture.

Question 13: What is the advantage of the conservation of moisture?

Answer: The advantage is to make the water which seeks to escape from the surface of the soil pass through cultivated plants.

Question 14: What is the best way to prevent loss of water from the surface of the soil by evaporation?

Answer: Frequent tillage, which loosens the soil to a depth of 5 to 8 centimeters. This dry loose soil acts like a coat or blanket on the surface of the earth. This shallow tillage should be renewed during the growing season as often as the surface of the soil becomes hard or baked.

The Brood Sow.

IN buying a brood sow it is well to note the following points:—

A sow with a good digestion must not only supply the pigs with all they demand at the start, but produce pigs that will take on fat when they are being prepared for market.

A sow's disposition should also be observed. If she is vicious, nervous and disposed to fight the other animals in the pen on slight provocation she will not make a good mother. She may be improved in this respect by care, but the right way is to breed for good disposition.

A nervous sow is not a good flesh producer, and her progeny will carry this failing as well.

A vicious sow is more likely to destroy her own pigs than one with a gentle disposition, and this is a very important matter to consider. While it is true a hog is simply a flesh-producing machine, yet the nervous condition is as much to be considered as any other point.—*(Agricultural Gazette, London.)*

Dairy Notes.

A NOISY, slow milker may ruin the best of cows.

Liberal feeding is necessary to liberal production.

Nothing adds to the quality of milk and cream like cleanliness in the dairy.

The cow which gives the most milk will not always make the most butter.

Brine washing of bottles may be classed as one of the best improvements in churning.

When the cow is fed a generous ration daily she will not shrink in her milk production until the proper time comes.

Putting the cream into a cold separator is sure to handicap the process of separation so much that much of the cream will go to waste.

In successful dairying the three main essentials are: proper kinds of stock, the greatest care of stock, and proper care of the product.

Usually a month or six weeks is all the average cow needs to rest and recuperate before calving, the time depending somewhat upon her condition. A thin, poor cow needs a longer rest than one in a thrifty condition.

In the case of a dairy cow, if her comfort is ignored, and through

exposure to bad weather she is compelled to draft upon her surplus energy, her entire system must contribute, and therefore her milk flow becomes reduced.

Distinctive Features in Cereal Plants.

HOW TO TELL ONE KIND OF PLANT FROM ANOTHER.

By W. J. MALDEN.

THE young farmer often finds it difficult to distinguish one kind of cereal crop from another until the ear appears; whilst those accustomed to crops in growth can perceive the difference even at considerable distance, the novice finds the difficulty both in respect to the crop as viewed as a whole, and also the parts individually. It is by no means easy to write an explanation of the difference in the appearance of a field of wheat (spring sown), barley or oats; and it is a very good test of descriptive ability to explain the differences verbally even when the three crops are before one. One may say one crop is a darker green than the other; that it looks more shiny, and waves differently as moved by the wind. But darkness of colour is not a definite guide. Wheat is generally of a darker colour than barley; but a field of wheat may be of a much lighter colour than an adjoining piece of barley. It is much a matter of the quantity of nitrogen taken up and the development of chlorophyll. Oats are often very dark green, but may be any shade to a yellow. The relative stiffness of the blade varies with age, so that is not a definite guide. Coming closer, one may notice the fleshy stem of the oat and the somewhat blunt tip to the flag; the corkscrewing of the leaf, particularly in barley, though it may not corkscrew at all. There are many other points one might mention, but practically all have these features more or less in common, or variably at different stages.

THE LIGULE AS A GUIDE.

There is, however, one sure guide for distinguishing wheat, barley, and oats, and that is the shape of the ligule, the usually whitish portion of the leaf where it joins its sheath. Each leaf or flag drops down from the point where it is in contact with the stem; if the flag is pulled gently it will peel down the stem to the next knob. Where the flag joins the stem there is a lightish collar, and the shape of this collar will decide the plant. If the two edges are extended so that the points, whilst embracing the stem, cross one another, and they are hairy, it is wheat; if

they cross, and there are no fine hairs, it is barley. In the case of oats the ligule is so short that the end not only do not overlap, but fail to meet. Thus, if the ligule is examined, there is no doubt as to the kind of cereal, as rye is very distinctive, because it always has a reddish tint near the ground, and the stem is always very narrow just above ground in comparison with the thickness above it. It may be mentioned that the ligule is most correctly distinctive when the uppermost one is examined, though the ligule at either of the lower flags will indicate the plant fairly easily.—(*Agricultural Gazette*, London.)

The Cause of the Germination of Seeds.

It is a matter of common observation that a stage exists in all vegetable life when the vital activities seem to be suspended. In most of the plants with which there is a common familiarity, this stage belongs to the seed. There is a period of dormancy, followed by what is called germination.

This period probably had its origin in the necessity for the provision of a form of protection during the time when the plant was surrounded by untoward conditions, as in winter, or in the dry season. The end of the resting period, as it may be called, came when those conditions were succeeded by others which were favourable. There is the additional consideration that time and opportunity had also been afforded for the wide separation of the embryo plant from its parent, or parents; provision was made for the distribution of the species.

These matters naturally lead to the question which asks what it is within the seed that causes an awakening of life to take advantage of the favourable conditions that occur once again. The answer given by the most careful investigations that have been undertaken up to the present is, that the cause is provided by the ability of the protoplasm in the seed to respond to its surroundings.—(*Agricultural News*, West Indies.)

If the milk from which butter is to be made is all tainted, it, or cream obtained from it, should be pasteurised. This process kills the greater number of the germs present before those specially desired to bring about the ripening are added to cream. The heating of the milk also causes many volatile taints in the milk to disappear.

Meteorological Returns.*Meteorological Observations taken at the Govt. Stations for the Month of April, 1910.*

STATIONS	TEMPERATURE (Fahr. Deg.)				RAINFALL (In Inches)						
	Means for Month		Maximum for Month	Minimum for Month	Total for Month	No of Days	Heaviest rainfall in 1 day.		Total for Year from July 1 1909	Total for same period from July 1 1908	
	Maximum	Minimum					Fall	Day			
Observatory	78.3	62.9	84.4	53.5	2.81	6	1.07	2nd	44.18	33.57	
Stanger	81.9	61.0	92	51	3.37	7	1.33	1st	42.72	35.53	
Verulam	82.2	59.9	98	50	2.65	7	.71	9th	32.83	31.22	
Greytown	78.0	47.5	90	51	1.32	7	.69	17th	31.95	40.06	
Newcastle	83.9	56.1	92	20	.36	3	.20	2nd	31.24	—	
Lidgetton	77.3	47.9	86	22	1.10	7	.23	17th	39.24	40.43	
Estcourt	76.7	49.4	85	34	1.43	5	.93	18th	29.13	29.27	
Umbogintwini	79.9	60.6	85	48	2.04	9	1.04	2nd	44.31	—	
Mid-Illovo	75.5	57.8	84	46	1.76	7	.72	2nd	34.67	37.63	
Imbizana	78.4	60.5	86	50	4.62	9	1.72	3rd	40.13	35.71	
Port Shepstone	78.7	61.5	88	52	2.49	7	1.40	3rd	40.04	35.95	
Umsinto	83.8	51.8	98	49	.97	3	.52	17th	39.95	33.34	
Richmond	75.4	52.4	85	39	1.18	11	.43	17th	40.76	48.63	
Maritzburg	78.1	54.8	86	39	.77	7	.40	17th	35.11	34.39	
Howick	77.3	49.3	86	32	.74	4	.34	17th	31.40	37.27	
Ladysmith	83.0	50.3	92	36	.32	3	.13	1st	27.04	—	
Dundee	78.1	51.0	85	39	1.90	4	1.26	18th	28.89	33.45	
Weenen	87.9	50.2	98	35	.52	6	.36	17th	25.64	31.01	
Krantzkloof	78.1	53.2	90	49	1.78	10	.39	2nd	38.88	35.44	
New Hanover	81.5	51.2	89	38	1.77	3	1.40	17th	42.34	37.94	
Krantzkop	79.1	50.9	85	40	1.14	5	.39	1st	36.21	30.76	
Nqutu	—	—	—	—	—	—	—	—	—	36.03	
Empangeni	82.1	58.9	91	47	6.52	6	3.12	2nd	50.05	37.73	
Ubombo	74.6	58.3	84	50	3.40	6	1.40	2nd	52.26	41.00	
Mtunzini	81.5	55.2	89	50	9.92	6	5.30	1st	78.82	59.61	
Point	—	—	—	—	4.10	7	.90	2nd	48.19	38.47	
Nottingham Road	73.1	41.2	83	20	.98	7	.53	3rd	29.38	—	
Charlestown	73.2	42.5	80	27	.24	5	.18	15th	31.73	43.89	
Bulwer	—	—	—	—	.77	10	.18	2nd	44.42	55.10	
Jxopo	—	—	—	—	.89	6	.36	22nd	33.46	33.11	

Meteorological Observations taken at Private Stations for the Month of April, 1910.

STATIONS	TEMPERATURE (In Fahr. Degs.)		RAINFALL (In Inches)						
	Maximum for Month	Minimum for Month	Total for Month	No. of Days	Heaviest rainfall in 1 day		Total for Year from July 1, 1909	Total for same period from July 1, 1908	
					Fall	Day			
Hilton	83	36	.63	7	.26	17th	37.28	39.51	
P.M.B. Botanical Gardens	88	37	.93	7	.41	17th	31.92	35.30	
Ottawa	—	—	3.02	9	1.05	10th	33.97	31.69	
Mount Edgecombe	—	—	11.87	8	.90	3rd	40.38	—	
Umsinto, Beneva	—	—	1.92	6	1.06	2nd	39.75	35.63	
Riet Vlei	—	—	1.62	5	1.41	17th	25.94	30.32	
Cedara—Vlei Station	82	29	.73	12	.40	18th	—	—	
Winkel Spruit	85	51	2.60	5	1.38	2nd	40.78	37.60	
Weenen	90	33	.66	5	.41	17th	21.51	—	
Giant's Castle	69.8	47	1.41	5	.76	3rd	41.51	41.44	
Umlhlangeni	—	—	2.41	9	1.26	2nd	—	—	
Eshowe	—	—	4.17	6	1.35	3rd	—	—	

Return of Farms at Present under Licence for Lung sickness and Scab.

STOCK INSPECTOR.	DISTRICT.	DISEASE.	OWNER.	FARM.
A. P. Craw	Ladysmith	Scab	Natives	Roosboom
		"	Natives	Rooipoort
		"	J. Farquhar	Stew rt Park
		"	P. Reuten	Mt. Pleasant
A. B. Koe	Portion of Estcourt	"	R. Mattison	Calcott
		"	W. Crouch	Oakhampton
		"	C. Hatting	Doornkop
		"	J. Ralfe	Frere
A. C. Williams	Utrecht	"	C. Lohuschagne	Haaslo tein
		"	G. H. Davel	Klipfontein
		"	J. D. Davel	Skuinshoek
		"	H. A. Davel	Klipfontein
		"	P. P. de Jager	Waterval
		"	W. Steenkamp	Hoekrantz
		"	A. T. D. vel	Klipfontein
		"	C. Combrink	Waterval
		"	J. D. van Coller	Klipfontein
		"	Natives	Goedehoop
L. Trenor	Alfred	Lungsickness	J. T. Clothier	Whitecliff
R. Wingfield Stratford	Newcastle	Scab	Natives	Location No. 2
L. G. Wingfield	Stratford	Lungsickness	C. Kemp	Highton
	Newcastle	Scab	Natives	Tiger Kop
		"	Messrs. Reynolds	
		"	ant Harvey	Rheobok Vlei
		"	R. S. Muller	Grootkopp
		"	T. Lazenby	Sprigbok
		"	Natives	Cavon
		"	M. Woithe	Byron
		"	J. Donovan	Wishhope
		"	R. D. Barry	Alicedale
		"	J. Watt	Lombardy
		"	J. Dick	Bernard
		"	J. Joubert	Frantzhoek
		"	G. Adendorff	Bosch Hoek
		"	H. Vernon	Moodelaagte
		"	H. W. Schultz	Uitzicht
G. Daniell	Vryheid	"	H. Shippey	
		"	Mrs. Webb	Rensburg
		"	R. P. van Rooyen	Brakslout
		"	Natives	Mademoiselle
		"	J. H. Key	Ve geneeg
		"	Natives	Trado
		"	"	Hl bane
		"	M. B. Curtis	Sandrust
		"	J. M. Kockemore	Brakslout
J. B. Cooper	Nkandhla & Nqutu	"	H. J. du Preez	Good . o . e
		"	J. C. du Preez	"
		"	J. G. du Preez	Lakochelle
		"	Natives	Dalala
		"	"	Nagurtonus
		"	"	Telezi Hill
		"	J. A. de Waal	Nqudeni
		"	John Mate	Itala Hill
		"	Petrus Mate	"
E. Varty	Western Umvoti	"	F. R. Nel	Vermaak's Kraal
		"	P. M. van Rooyen	Pampoen Nek
		"	H. S. Vermaak	Haartebeeste Laagte
R. Mayne	Eastern Umvoti	"	L. M. J. van Rooye	Sweethome
	Krantzkop	"	D. Havemann	Umvoti Port
A. H. Ball	Wenen	"	P. P. van Rooyen	Doornkloof
		"	D. P. Naude	Scottshoek
R. J. Marshall	Dundee	"	Harve & Retallack	Sterkstroom
		"	A. Ja sen	Sheepridge
		"	E. G. Wohli z	Stille Rust
J. F. van Rensburg	Ngotshe	"	J. Collie	Goudhoek
E. W. Larkan	Umsinga	"	S. J. Kemp	Uithoek
		"	L. E. O. Du Bois	Balgervanie
		"	J. Dedekind	Elands Berg
K. Ripley	Emtonjaneni	"	Natives	Crown Lands, Beyela
C. E. Walker	Portion of Estcourt	"	A. F. Henderson	Milbrake Fe l
H. Van Rooyen		"	P. Male	Sanham
A. Hair	Babanango	"	J. G. J. Blanche	Visgewacht
J. Radford (acting)	City and Umgeni	"	E. Taylor	Zwaartkop Location
	Paulpietersburg	"	G. L. Combrink	Rookop
		"	J. Dekker	Politique

Division of Agriculture & Forestry Notices

FEES FOR AGRICULTURAL ANALYSIS.

It is hereby notified that Farmers and others can secure analytical determinations from the Government Laboratory, Central Experimental Farm, Cedara, in accordance with the following scale of fees, which is subject to revision :—

	Scale I.	Scale II.
FERTILISERS AND FEEDING STUFFS :	£ s. d.	£ s. d.
Determination of 1 constituent	0 7 6	0 5 0
Determination of 2 or 3 constituents	0 15 0	0 10 0
Complete analysis	1 1 0	0 15 0
SOILS : Partial analysis of a soil in relation to its fertility	1 1 0	0 10 6
Complete analysis of a soil	2 2 0	1 1 0
WATER : Irrigation and drainage	1 10 0	0 10 6
VEGETABLE PRODUCE : Fodder, Ensilage, Grain, &c.	1 10 0	0 15 0
MILK, CREAM, BUTTER : Fat only	0 5 0	0 2 6
" " : Complete	0 15 0	0 7 6
WATTLE BARK AND TEA : Tannin	0 5 0	0 2 6
CATTLE DIPS : Quantitative analysis of 1 to 3 principle constituents	0 10 0	0 5 0
INSECTICIDES :		
Qualitative analysis each constituent	0 5 0	0 2 6
Quantitative " " "	0 10 3	0 5 0

Scale No. 1 is applicable to samples handed in by merchants and Dealers, and where trade interests are involved.

Scale No. 2 is applicable to samples forwarded by *bona fide* Farmers and Gardeners.

Samples will be accepted at the discretion of the Director, and must be properly selected and labelled.

The Department reserves the right to publish the results of any analysis performed by it; and, where such is deemed of sufficient public interest, it will remain at the discretion of the Director to remit any charges hereunder.

TREES FOR SALE.

To encourage tree-planting, transplants and seeds of forest trees are supplied by Government, so far as in stock, at the undermentioned rates, exclusive of carriage, from the Government Nursery, Central Experimental Farm, Cedara.

Transplants of Eucalyptus, Pines, Acacias, Casaurinas, Cupressus, etc., about 25 trees in each tin, at 8s. 4d. per 100 trees. Trees in separate tins at 1s. each.

Transplants of scarce kinds, larger trees, or surplus stock, when available, will be charged at special rates, which will be furnished on application.

Tree seeds, in variety, at 6d. per packet. Price per pound, which fluctuates, will be furnished on application.

Package and postage of seed, when required, charged 1s. per lb. extra.

Orders cannot be accepted for a smaller number than 100 trees.

PURCHASE OF TREE SEEDS.

With a view to the encouragement of seed production in the Colony, offers are invited from persons having locally-grown seed of exotic trees for sale. Not less than one pound will be purchased; and a specimen bearing seed vessels or flowers should be sent for identification purposes.

SILVER POPLAR.

Root suckers of the Silver Poplar (*Populus alba*) can be supplied in any quantity, at 8s. 4d. per hundred, on application.

POULTRY.

Cockerels and a few Pullets of the following breeds for sale:—Buff Orpingtons, Wyandottes, Plymouth Rocks and Black Leghorns.

PERSIAN SHEEP.

An imported Woollen Persian Ram may be hired for the season at a fee of £5, at hirer's risk. Particulars on application. Orders for Haired Persian Rams will be booked for future delivery.

WOOLLED SHEEP.

Offers are invited for young imported Rams being Rambouillet Merinos, Lincolns, Hampshires, Shropshires. Inspection can be arranged to suit intending purchasers.

CORRESPONDENCE.

Communications relating to the following subjects should be addressed in the first place to the officers responsible:—

Admittance of Students to the School of Agriculture.—House Master, Cedara.
 Analyses of Soils, Fertilisers, etc.—Analyst, Cedara.
 Felling Licenses, Purchase of Timber Sections and Squatters' Holdings in Crown Forests.—Chief Forest Officer, Ixopo.
 Afforestation, Timber Trees and Seeds.—Chief Afforestation Officer, Cedara.
 Agricultural Seeds, Livestock, etc.—Farm Manager, C.X.F., Cedara.
 Tropical Plants, Seeds, etc.—Manager, Government Farm, Winkle Spruit.
 Agricultural Seeds, etc., for Irrigation Farming.—Curator, Govt Station, Weenen.
 Fruit.—Orchardist, Cedara.
 Accounting Business.—Accounting Clerk, Cedara.
 Woolled Sheep, Woolled Classings, &c.—Wool Expert, Cedara.
 Apiculture — Aviarist, Cedara.

E. R. SAWER,

Director, Division Agriculture and Forestry, Cedara.

Diamond Drilling.

SOME of the departmental diamond drilling plants are at present disengaged and available for hire for boring for either minerals or water. Particulars as to terms of hire may be obtained from the undersigned.

CHAS. J. GRAY,
 Commissioner of Mines.

Employment Bureau.

THE Department of Agriculture has received applications from the undermentioned, who are prepared to become assistants or apprentices on farms. The Department will be glad to hear from farmers willing to take young men as assistants, and to place them in correspondence with the various applicants. Communications should be addressed to the office of this *Journal*.

No. 115.—Englishman, 26 years of age, steady and an abstainer, with a knowledge of cattle and horses, wishes employment on a farm in Natal (English preferred) as a handy man, with a view to furthering his knowledge of farming in this country. Is willing to accept food and clothing in a good home, for services, for a few months with the prospect of a small wage after the first three months.

No. 117.—Englishman, 25, of good education, desires appointment as overseer on a plantation in Natal, and would pay a reasonable premium and give services free for a few months if necessary. Has had commercial, engineering, surveying and mining experience.

No. 119.—Lady, experienced in dairy work, is desirous of taking charge of a dairy. Has gone through a course of butter and cheese-making, and holds good testimonials from Mr. J. Marshall Douglas, Chairman of the Royal Agricultural Society of England (1905).

No. 121.—Desires open air employment. Age 43. Life experience of agricultural pedigree and prize stock gained in Scotland. Has been six years in South Africa. First-class references and testimonials. Small salary required.

No. 122.—A young man, with life-long experience of cane-growing, desires employment as manager or overseer on a plantation. Experience has been in Queensland and Fiji. Is good at figures and capable of taking charge of books if necessary.

No. 126.—Colonial, 35 years of age, desires to obtain a position as overseer or manager of an ostrich farm. Has been for some years with first-class farmers, and had charge of some of the best birds in the Cape Colony. Has a practical knowledge of incubating, rearing of chicks, dosing and general management.

No. 127.—An expert fruit packer of four years' experience in Spain and France, and twenty years Colonial experience, is open to accept an engagement after 25th April next. He is open to accept low wages, with board and lodging, and fare to and from the Cape where he is at present.

No. 128.—Wishes to secure employment on a farm. States that he has a general knowledge of engineering, and has been employed on a large and well-known farm in the Richmond Division.

No. 131.—Age 20. Was a student at College of Agriculture, Cape Colony, where he gained a diploma. Has also won prizes for butter making at the Rosebank and Port Elizabeth Shows. Has been in the services of the Orangia Creamery Co., Bethlehem, which he left on account of conditions of employment not being suitable to his requirements.

No. 132. Age 37. Has had nine years experience as Assistant and Manager on Tea Estate in Assam, and has a thorough practical knowledge of tea making in all its Departments. Would like to obtain an appointment in a Tea Garden in Natal. Has a knowledge of several Indian languages.

No. 133.—Desires appointment as Farm Manager. Has had a thorough knowledge of growing and packing fruit, also lucerne growing and hay making. Has also had experience in Ostrich and Stock farming.

No. 134.—Age 37. Wishes to obtain experience on an Ostrich farm for a year. Would be willing to invest £700 at the end of the term of probation, and on the expiry of a year's partnership would be willing to increase that sum to £1,000.

No. 135.—Age 35. Has a knowledge of poultry and bee-keeping. Total abstainer. Non-smoker. Good references. Is anxious to get on to a farm.

No. 136.—Wishes to secure employment on an Ostrich farm. Very good references.

No. 137.—Understands carpentry and wagon making. Is anxious to secure a position on a farm.

Farmers requiring good, steady farm hands would do well to communicate with Ensign Anderson, of the Salvation Army Shelter, Maritzburg, who constantly has good men at the Shelter who would be glad of employment at reasonable rates. Ensign Anderson pledges himself not to recommend for employment any

but those he is satisfied will give satisfaction to their employers. He will be pleased to enter into correspondence with any farmer who may address him on the subject.

EMPLOYMENT FOR GIRLS.

The Minister of Agriculture has received a letter from the Chairman of the Transvaal Land Settlement Board, stating that he has been asked by several correspondents in England if there are any openings in South Africa, such as in creameries, for girls trained at Bromsgrove Colonial College and other such training centres in England. We should be glad to hear from any institutions or farmers in Natal who may be in a position to offer situations to girls who have been trained at such Colleges, when we shall be pleased to place them in communication with the Chairman of the Transvaal Land Settlement Board.

Agricultural and Other Shows, 1910.

CAMPERDOWN (Camperdown Agricultural Society).—Show, 22nd July. Walker and Burchell, Camperdown, *Secretaries*.

DUNDEE (Dundee Agricultural Society).—Show, 23rd and 24th June. Late entries, 22nd June. J. McKenzie, Box 105, Dundee, *Secretary*.

DURBAN (Durban and Coast Society of Agriculture and Industry).—Show, 6th, 7th and 8th July. J. Morley, 399, Smith Street, Durban, *Secretary*.

DURBAN (Durban County Farmers' Association).—Hold no Show, but an Exhibit will be arranged for at the Show held by the Durban and Coast Society of Agriculture and Industry. F. J. Volett, New Germany, *Secretary*.

DURBAN (Durban and Coast Poultry Club).—Show 6th, 7th and 8th July. H. M. Fletcher, 20, Castle Arcade, Durban, *Secretary*.

ESTCOURT (Weenen Agricultural Society).—Show, 21st and 22nd June. E. Cauterley, Estcourt, *Secretary*.

GREYTOWN (Umvoti Agricultural Society).—Show, 8th June. W. H. Gibbs, Box 24, Greytown, *Secretary*.

GREYTOWN (Umvoti Farmers' Association).—Date not yet fixed. C. J. Nel, Greytown, *Secretary*.

LADYSMITH (Klip River Agricultural Society).—Show, 10th and 11th June. W. J. Teasdale, Ladysmith, *Secretary*.

MID-ILLOVO (Mid-Illovo Farmers' Club).—Show held under the Mid-Illovo Agricultural Society. J. W. V. Montgomery, Ismont, Mid-Illovo, *Secretary*.

NEW HANOVER (New Hanover Agricultural Association).—Show, 18th August. W. D. Stewart, New Hanover, *Secretary*.

PIETERMARITZBURG (Royal Agricultural Society).—Show, 16th, 17th and 18th June. Duff, Eadie & Co., Timber Street, Pietermaritzburg, *Secretaries*.

PIETERMARITZBURG (Natal Poultry Club).—Show, 16th, 17th and 18th June, in conjunction with the Royal Agricultural Society's Show. E. G. Blundell, Box 250, *Secretary*.

RICHMOND (Richmond Agricultural Society).—Show 20th July. Entries close, 30th June. C. Williams, *Secretary*.

STANGER (Victoria County Agricultural Society).—Show, 29th June. H. C. Smith, Stanger, *Secretary*.

SOCIETIES HOLDING NO SHOWS.

Bryne Farmers' Association; Boston Farmers' Association; Donnybrook Farmers Association; Dronk Vlei Farmers' Association; Garden Castle Farmers' Club; Greytown Horticultural Society; Ladysmith Farmers' Association; Malton Farmers' Association; Polela Agricultural Society; Seven Oaks Farmers' Association; Umsinga-Biggarsburg Farmers' Association; Utrecht Boeren Vereeniging; Vryheid Agricultural Society.

Frere Dipping Association; Alfred County Farmers' Association and Agricultural Society.

Farm Apprentices' Bureau.

THE following is a list of the applicants which have so far been received by the Editor of the *Natal Agricultural Journal* from boys desirous of obtaining positions on farms. Farmers wishing to get into communication with any of these applicants should address their enquiries to the office of this journal.

The majority of the applicants have, of course, had no farm experience, but all appear to be strong, healthy and willing.

- | | | |
|--------|---------|--|
| No. 3. | Age 24. | Colonial born. Has a knowledge of bookkeeping. |
| „ 15. | Age 19. | Is desirous of learning farming. |
| „ 25. | Age 23. | Bricklayer by trade. Is anxious to get on a farm. |
| „ 27. | Age 19. | Has had one year's experience on a farm in the Cape Colony. |
| „ 35. | Age 21. | Has had five years' experience on farms. Understands cattle and horses and Agriculture. Is anxious to get back on a farm. |
| „ 40. | Age 24. | Has had a little experience of farm life. Understands bee-keeping. Is anxious to get on a farm. |
| „ 46. | Age 21. | Served a term of apprenticeship to a firm of agricultural implement makers. Industrious and level-headed lad. Very good references. |
| „ 47. | Age 21. | Is anxious to obtain a situation on a farm. Has been in iron-mongery trade for 2½ years. |
| „ 49. | Age 21. | Colonial born. Has had three years' experience on farms, two years in the Mooi River Division and one year dairy farming in the Transvaal. Good references. Speaks Zulu. |
| „ 53. | Age 17. | Has had 18 months' experience of farming in Zululand. Speaks Zulu. Understands cattle and horses. |
| „ 54. | Age 18. | Has had 18 months' experience of farming at Harrismith. Speaks Zulu and Dutch. Understands cattle and horses. Is anxious to get back on a farm. |
| „ 55. | Age 16. | Has had a little experience. Speaks Zulu. Understands carpentry. Has been engaged in a Solicitor's office for four years. Is very obliging and willing. Anxious to get on to a farm. |
| „ 56. | Age 20. | Strong, tall and healthy, good rider, fond of stock, and has had some years experience of general farming. Small salary required with board and lodging. |

Brands Allotted to Infected Magisterial Divisions.

The following is a list of the brands which have been allotted to the several infected Magisterial Divisions:—Durban County, D. 2; Alexandra County, A. 2; Lower Tugela, T. 2; Mapumulo, S. 2; Inanda, B. 2; Umsinga, U. 2; Dundee, X. 2; Vryheid, V. 2; Ngotshe, H. 2; Paulpietersburg, P. 2; Nongoma, G. 2; Mahlabatini, L. 2; Ndwedve, N. 2; Weenen County, W. 2; Umvoti, F. 2; Hlabisa, K. 2; Eshowe, E. 2; Ladysmith, R. 2; Babanango, O. 2; Ladysmith, East of Line outside infected area, R. 3; Utrecht, Z. 2; Krantzkop, 2 K.; Umvoti Location, 2 F.; Ladysmith, West of main line of Railway, R. 3 on left neck; Pietermaritzburg City, 2 P.; Umlazi Location (Upper Umkomanzi portion), 2 U.; Umgeni Division, west of line, J. 2; Lion's River, east of line, 2 H.

Government Cold Stores and Abattoirs.

PIETERMARITZBURG.

It is notified for the information of Farmers and others that Government is prepared to receive Cattle at the Government Abattoir, Pietermaritzburg, for Slaughter and Storage, if necessary, upon the following Scale of Rates and Charges, or such of them as may meet the requirements of Cattle owners. It must, however, be understood that owners will be required to make their own arrangements for the sale of the meat of cattle sent in for slaughter, the Government being unable to offer facilities or to accept responsibilities in this regard.

Cattle may also be received for slaughter at the Government Abattoir, Point, Durban, at the charges noted below. As the Government is unable to offer facilities for cold storage at Durban, or for the sale of the meat of cattle sent for slaughter, it must be understood that owners will be required to make their own arrangements in these respects, and the Government is unable to accept responsibility in either regard at Durban.

Charges in respect of Cattle and the Meat of Cattle.	Calves up to one year old.	Cattle over one year old.		
		Rate per single head.	After reaching 100 head in month.	
<i>Abattoir.</i>		s. d.	s. d.	s. d.
1. Receiving, per head... ..	0 3	0 6	0 3	
2. Killing and Dressing, per head... ..	2 0	3 6	2 9	
3. Disinfectants	0 1	0 1	0 1	
4. Cleaning Tripes, each	0 6	0 6	0 6	
5. „ Sets Feet, per set	0 6	0 6	0 6	
6. „ Calves' Heads, each	0 9	—	—	
<i>Bagging Charge</i>				
1. Per Body of Beef	1 3	2 6	1 9	
2. Bagging Labour, per body	0 3	0 6	0 3	
Hessian, 3d. per yard.				
<i>Special Storage Rates for Chilling up to 72 hours.</i>				
1. Chilling Beef, per body	1 3	2 9	1 9	
2. Chilling Offal, per set	0 6	1 0	0 6	

A charge of 1s. per head is made in respect of any Sale of Cattle on leg at the Government Abattoir and a similar charge is made in respect of Bodies of Beef or portions thereof.

For further particulars apply to the Manager, Government Cold Stores.

Department of Agriculture, Maritzburg, 21st December, 1908.

Land and Agricultural Loan Fund.

The Land and Agricultural Loan Fund has now been established, and the Board are prepared to receive applications for advances on security of first mortgage on fixed property. Applications must be made upon special printed forms, which can be obtained, together with full particulars as to the conditions under which advances are made, from the office of the Fund, Colonial Offices, Pietermaritzburg.

All Correspondence should be addressed to the Secretary, Land and Agricultural Loan Fund, P.O. Box 357, Pietermaritzburg.

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UNITED KINGDOM AND BRITISH COLONIES.—Daily, £2 10s. per annum; including Weekly Edition, £3s. 2s.; Weekly Edition only, £1.

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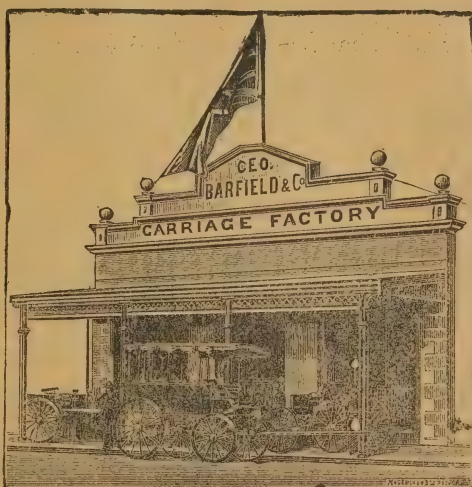
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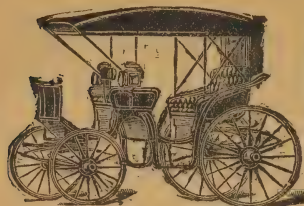
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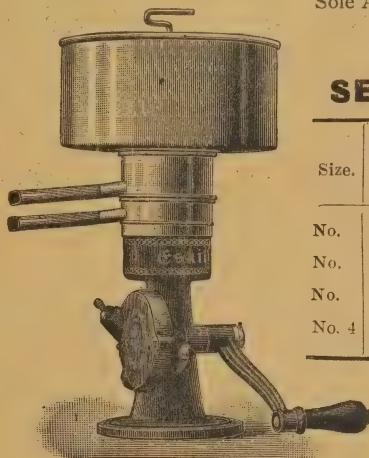
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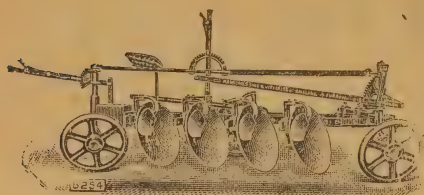
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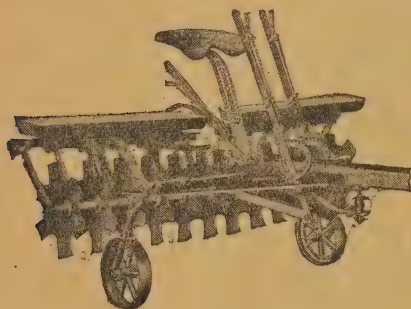
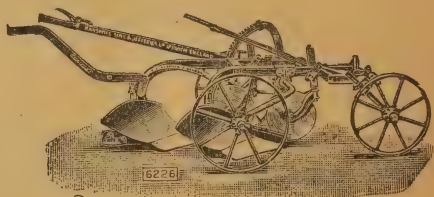
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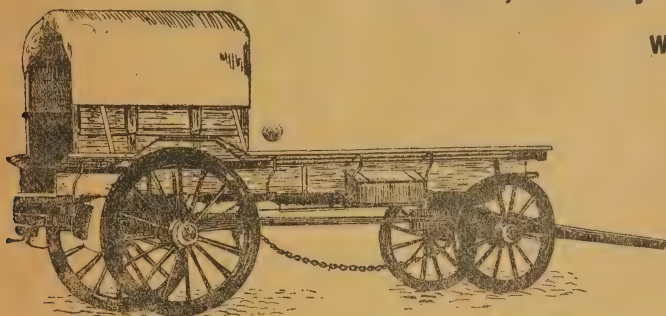
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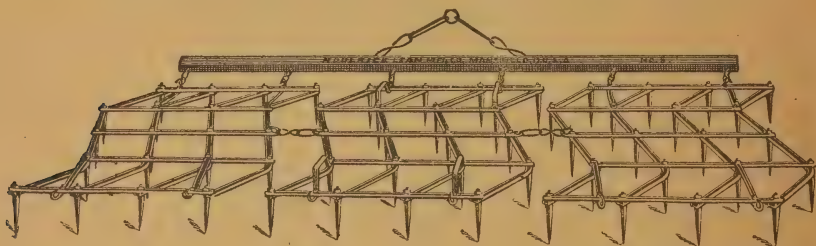
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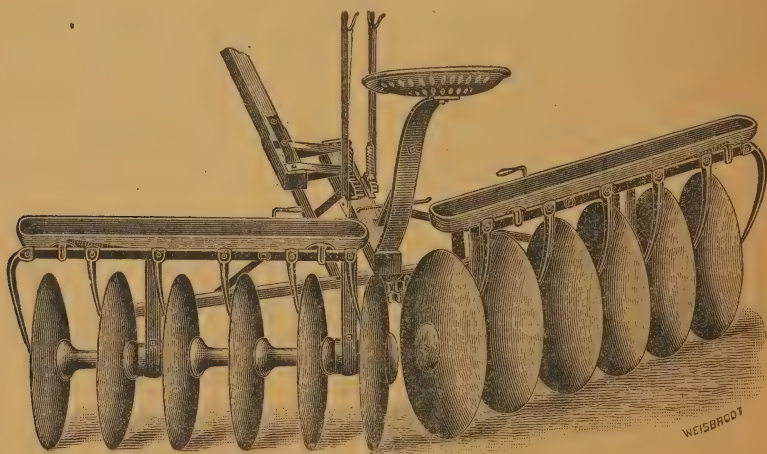
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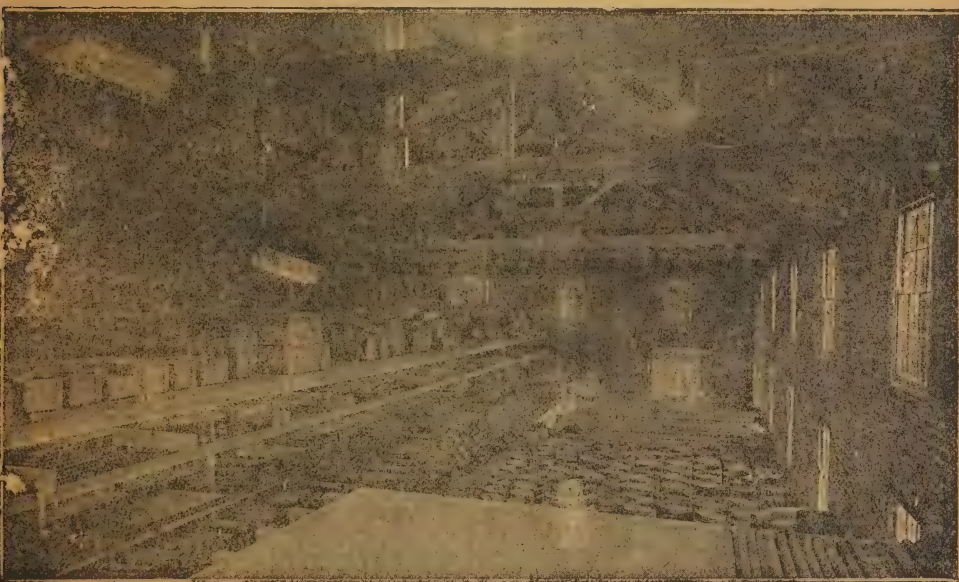
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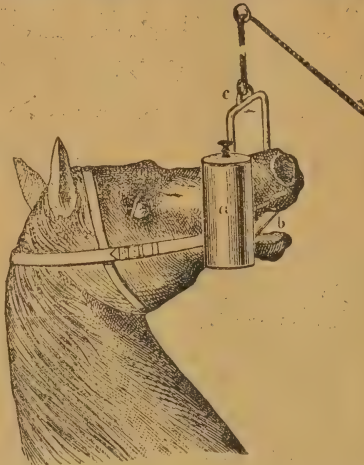
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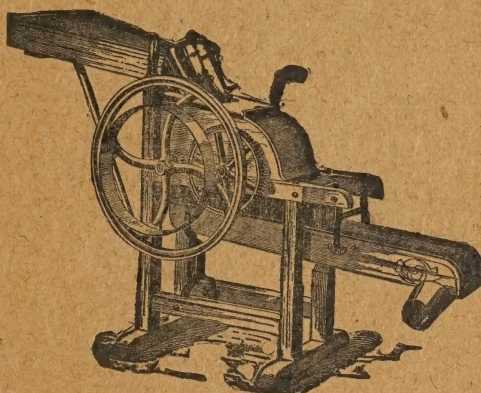
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